US008469790B1

(12) **United States Patent**
Itkis et al.

(10) **Patent No.: US 8,469,790 B1**
(45) **Date of Patent: Jun. 25, 2013**

(54) **WIRELESS WAGERING SYSTEM**

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(73) Assignee: **FortuNet, Inc.**, Las Vegas, NV (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **12/905,448**

(22) Filed: **Oct. 15, 2010**

Related U.S. Application Data

(63) Continuation-in-part of application No. 10/011,648, filed on Dec. 4, 2001, now abandoned.

(51) **Int. Cl.**
A63F 13/00 (2006.01)

(52) **U.S. Cl.**
USPC **463/19**; 463/42

(58) **Field of Classification Search**
USPC 463/19, 40, 42, 43
See application file for complete search history.

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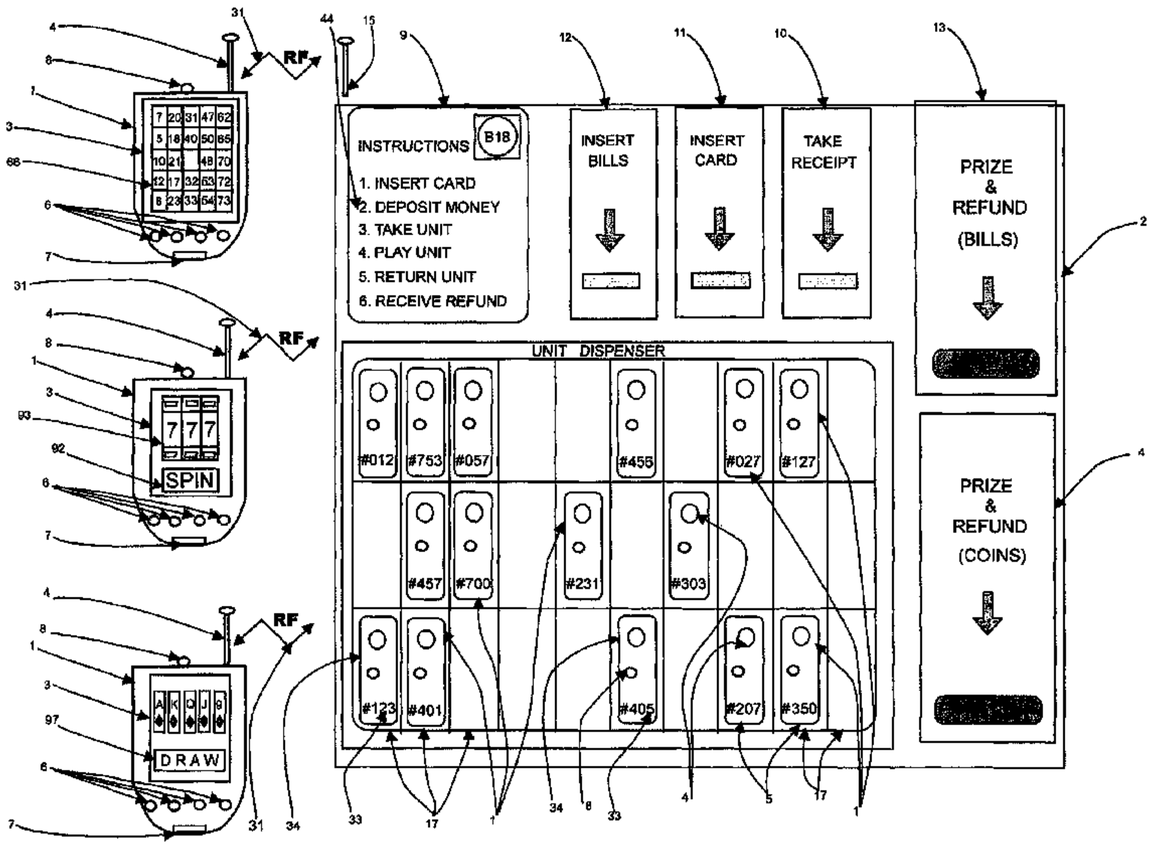
Primary Examiner — James S McClellan
(74) *Attorney, Agent, or Firm* — Greenberg Traurig

(57) **ABSTRACT**

Floor-agent-operated wireless barcode reader for reading the barcodes imprinted on bingo packs along with barcode labels affixed to player loyalty cards and portable and/or stationary bingo player units. The two or three barcodes read by the barcode reader are transmitted over a WiFi channel to a central file server that downloads bingo player units identified by the barcodes with the bingo packs bar-coded identification and/or contents over a local area network. In addition, the central file server tracks player spend utilizing the bar-coded player identification.

13 Claims, 20 Drawing Sheets



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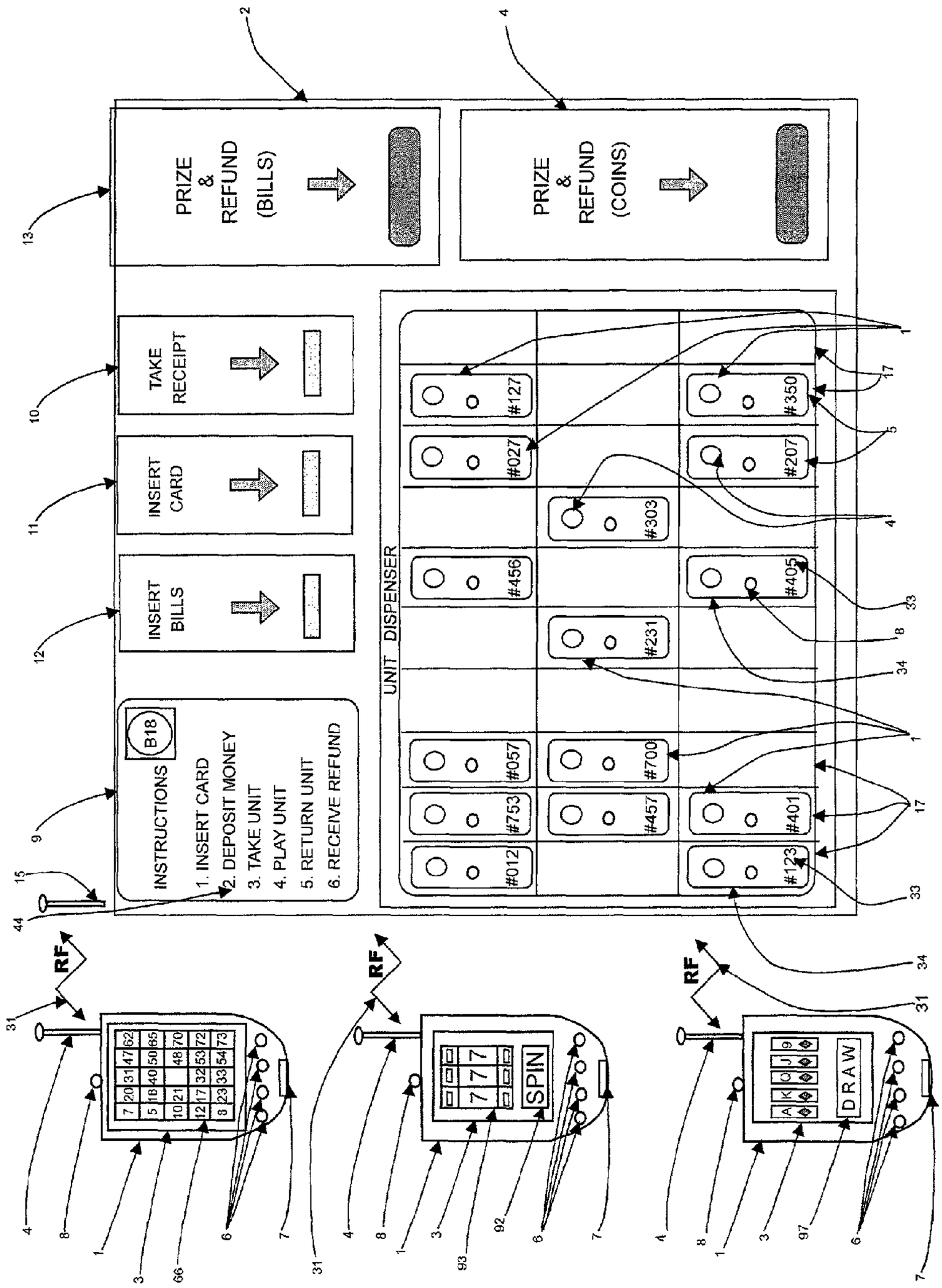

PRIZE & REFUND (BILLS)
PRIZE & REFUND (COINS)
TAKE RECEIPT
INSERT CARD
INSERT BILLS
INSTRUCTIONS
B18
1. INSERT CARD
2. DEPOSIT MONEY
3. TAKE UNIT
4. PLAY UNIT
5. RETURN UNIT
6. RECEIVE REFUND
UNIT DISPENSER
#012
#753
#057
#123
#401
#457
#700
#231
#303
#027
#127
#456
#405
#207
#350
RF
SPIN
DRAW

FIG. 1

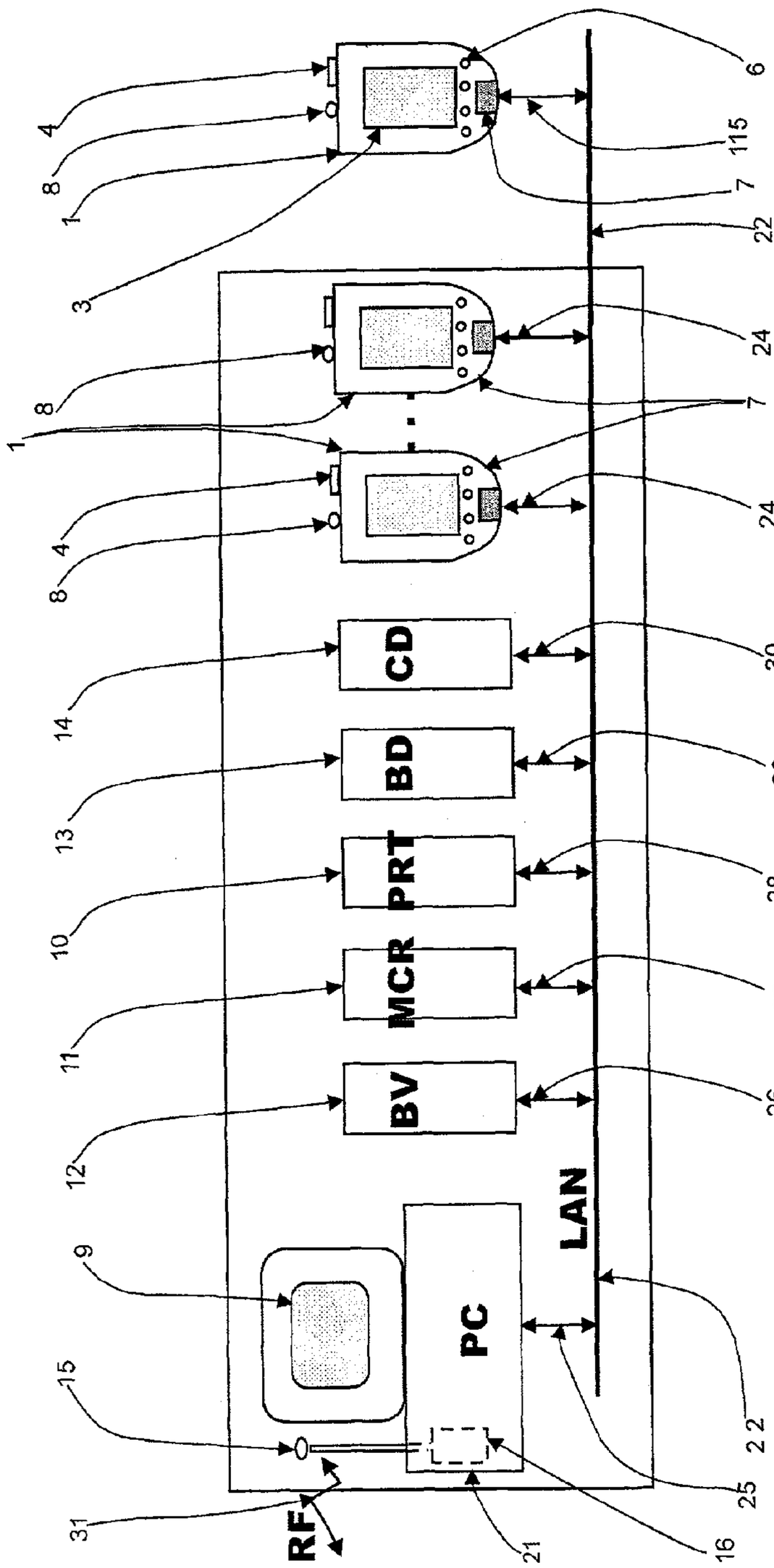
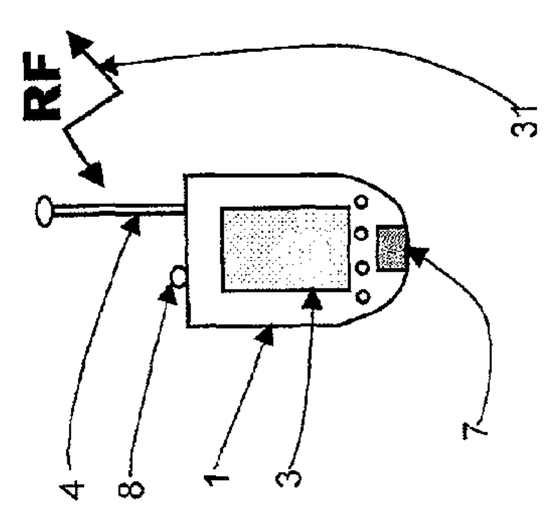

4
8
1
3
6
115
7
22
24
30
29
28
27
26
12
9
15
31
RF
PC
LAN
25
21
16
CD
BD
PRT
MCR
BV

FIG. 2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31
4
8
1
3
7

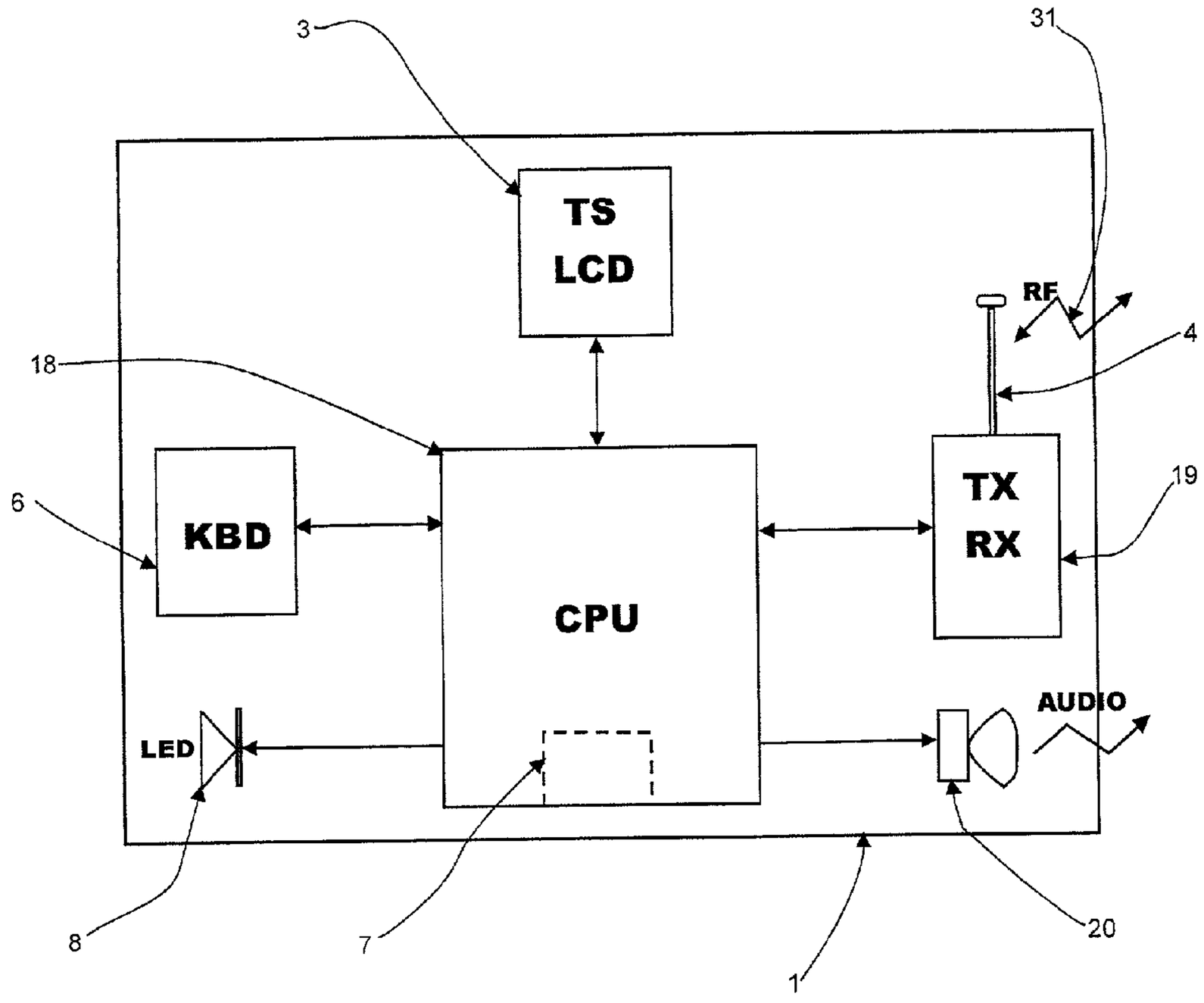


FIG. 3

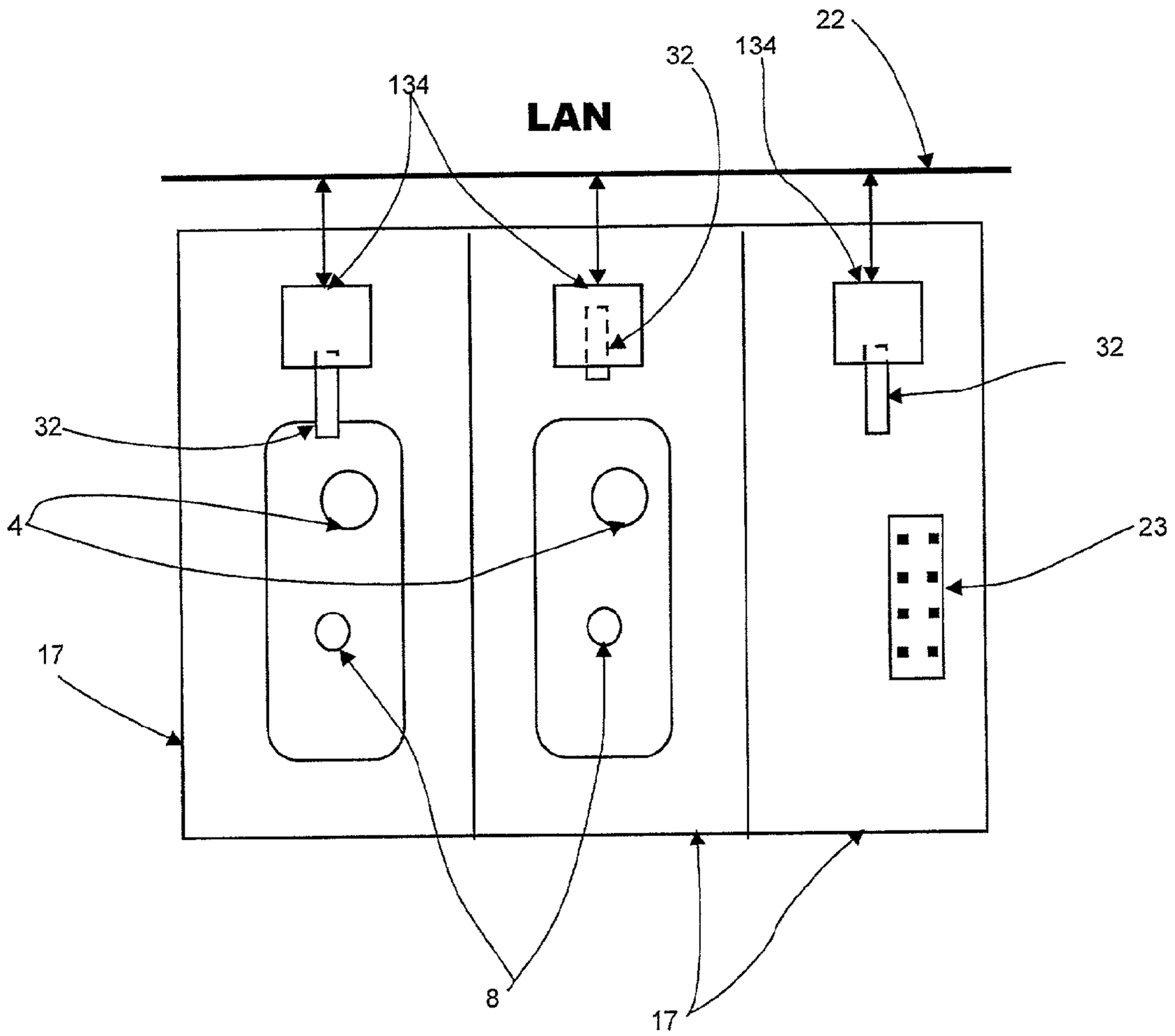


Fig. 4

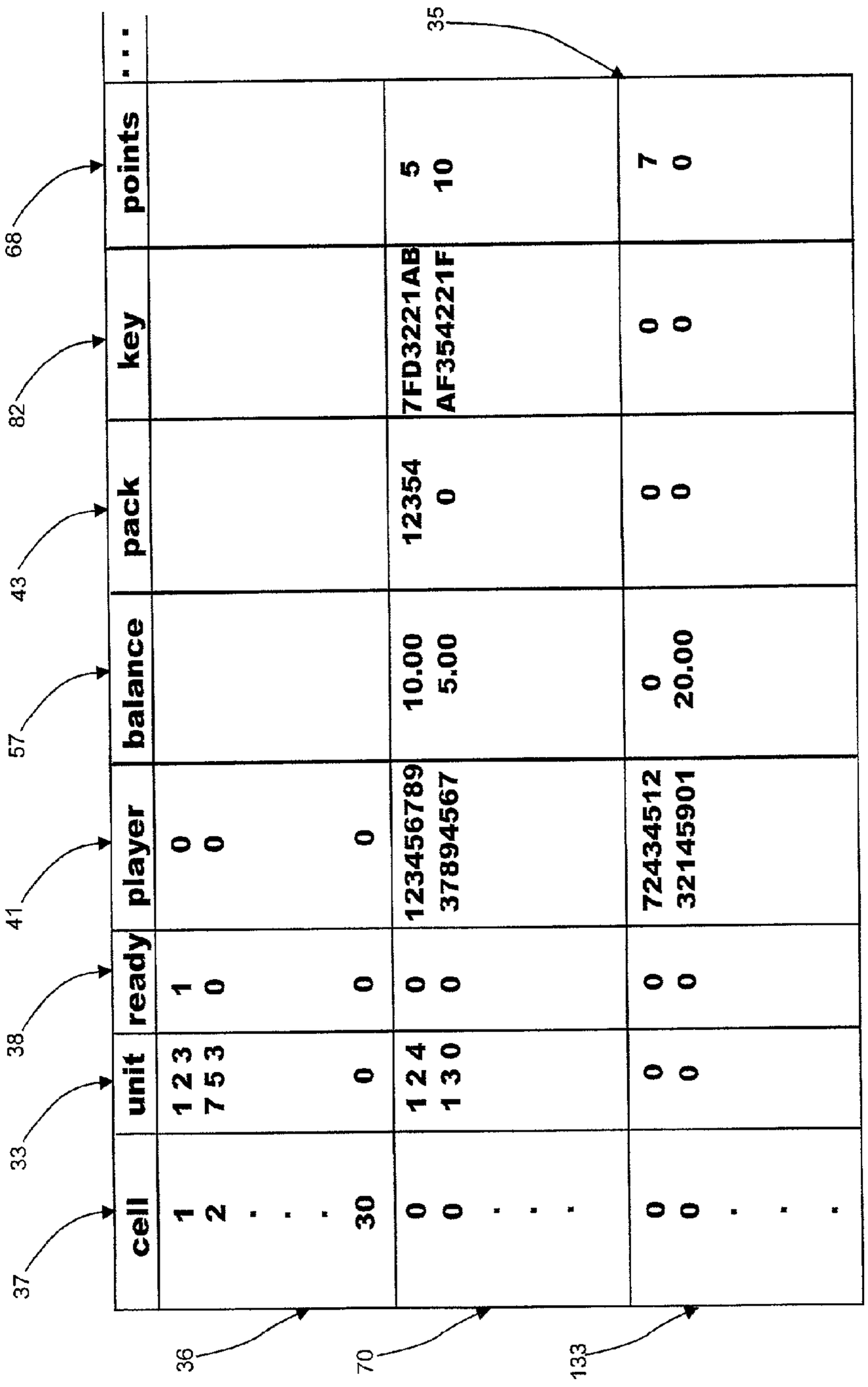

35
68
41
43
82
57
38
33
37
36
70
133
cell
unit
ready
player
balance
pack
key
points
...
5
10
7
0
1
2
30
1 2 3
7 5 3
0
1 2 4
1 3 0
123456789
378945678
724345121
321459010
10.00
5.00
0
20.00
12354
0
7FD3221AB
AF354221F

FIG. 5

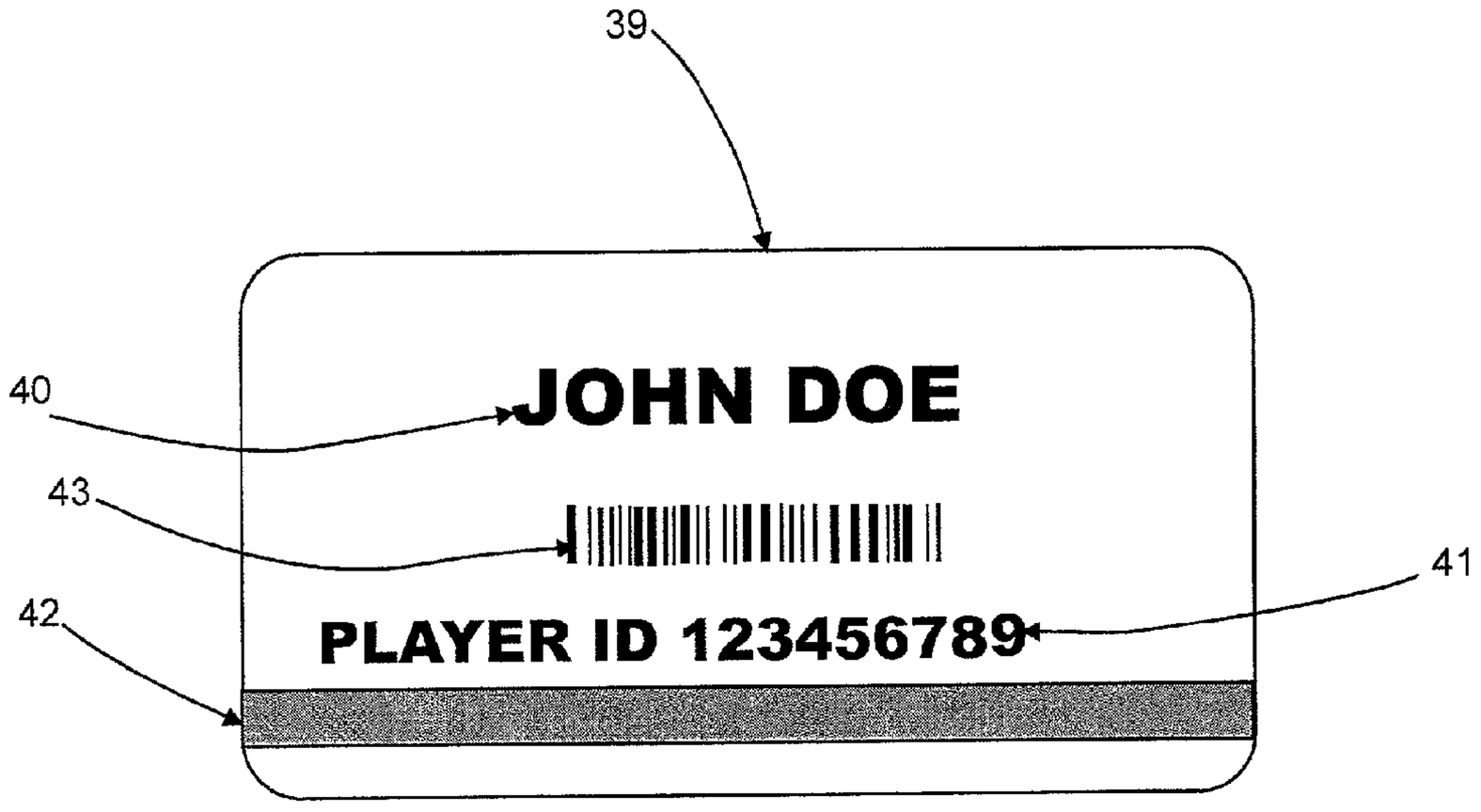


Fig. 6

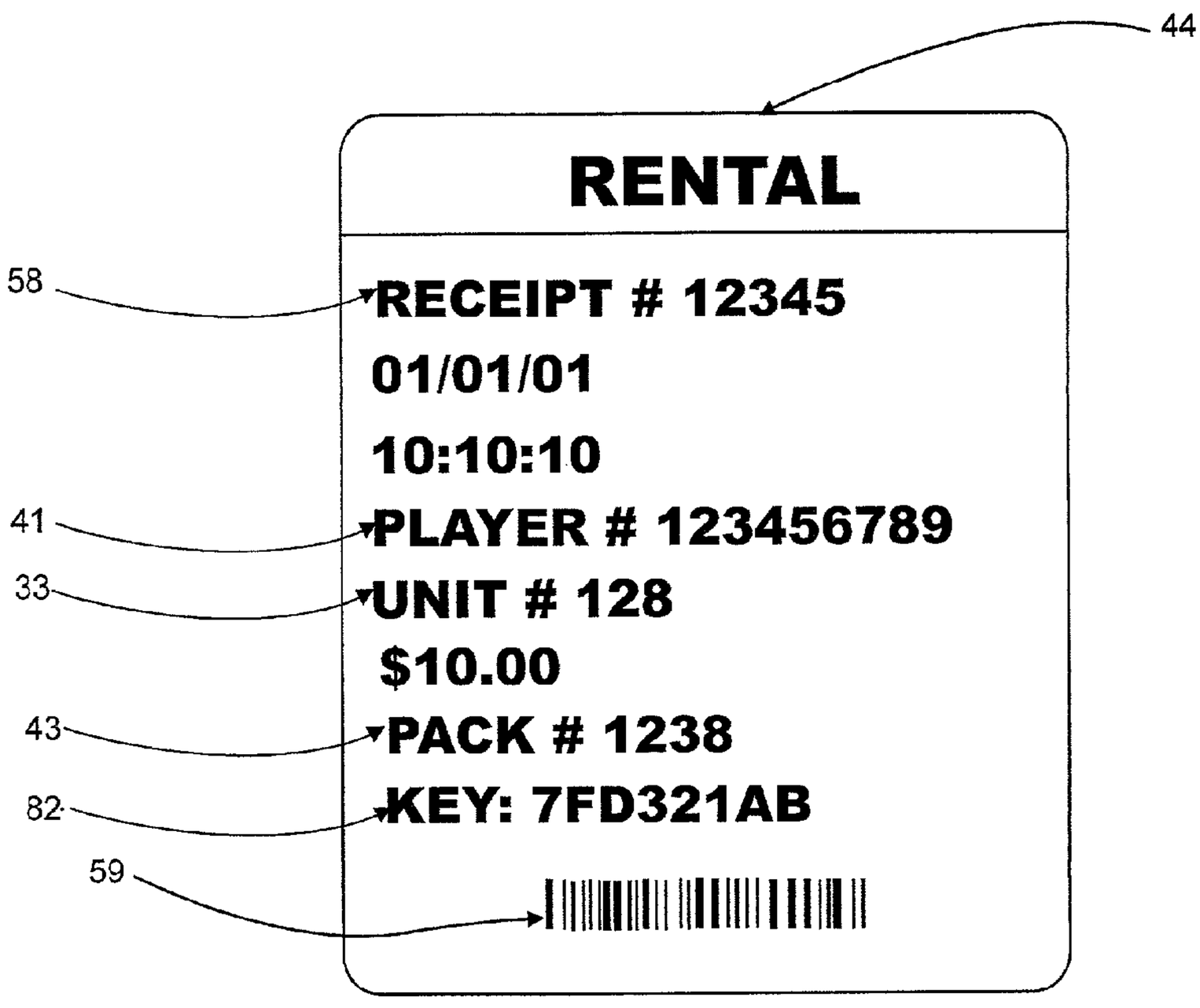

44
RENTAL
58
RECEIPT # 12345
01/01/01
10:10:10
41
PLAYER # 123456789
33
UNIT # 128
$10.00
43
PACK # 1238
82
KEY: 7FD321AB
59

Fig.7

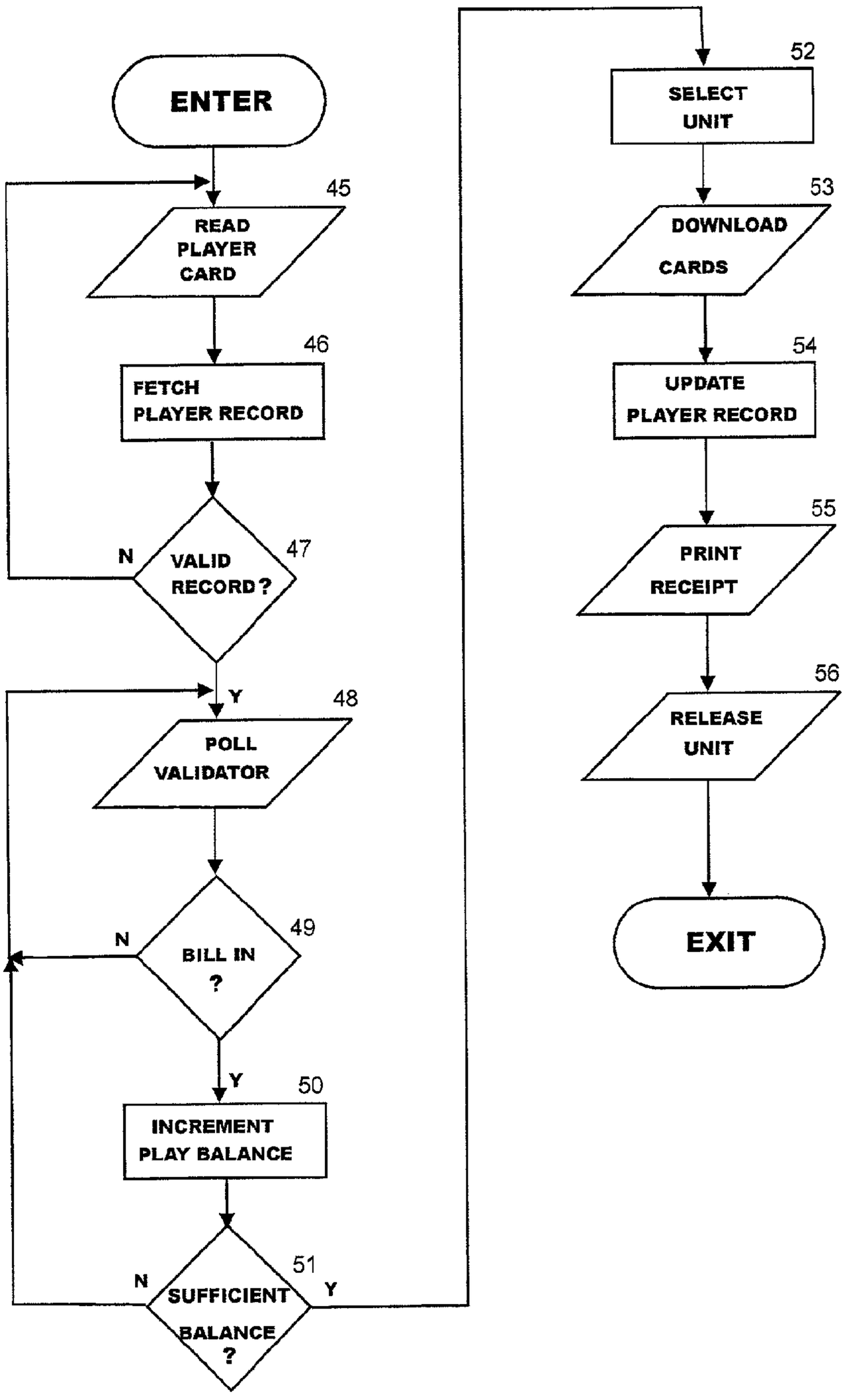

ENTER
45
READ PLAYER CARD
46
FETCH PLAYER RECORD
47
N
VALID RECORD?
Y
48
POLL VALIDATOR
49
N
BILL IN ?
Y
50
INCREMENT PLAY BALANCE
51
N
SUFFICIENT BALANCE ?
Y
52
SELECT UNIT
53
DOWNLOAD CARDS
54
UPDATE PLAYER RECORD
55
PRINT RECEIPT
56
RELEASE UNIT
EXIT

Fig. 8

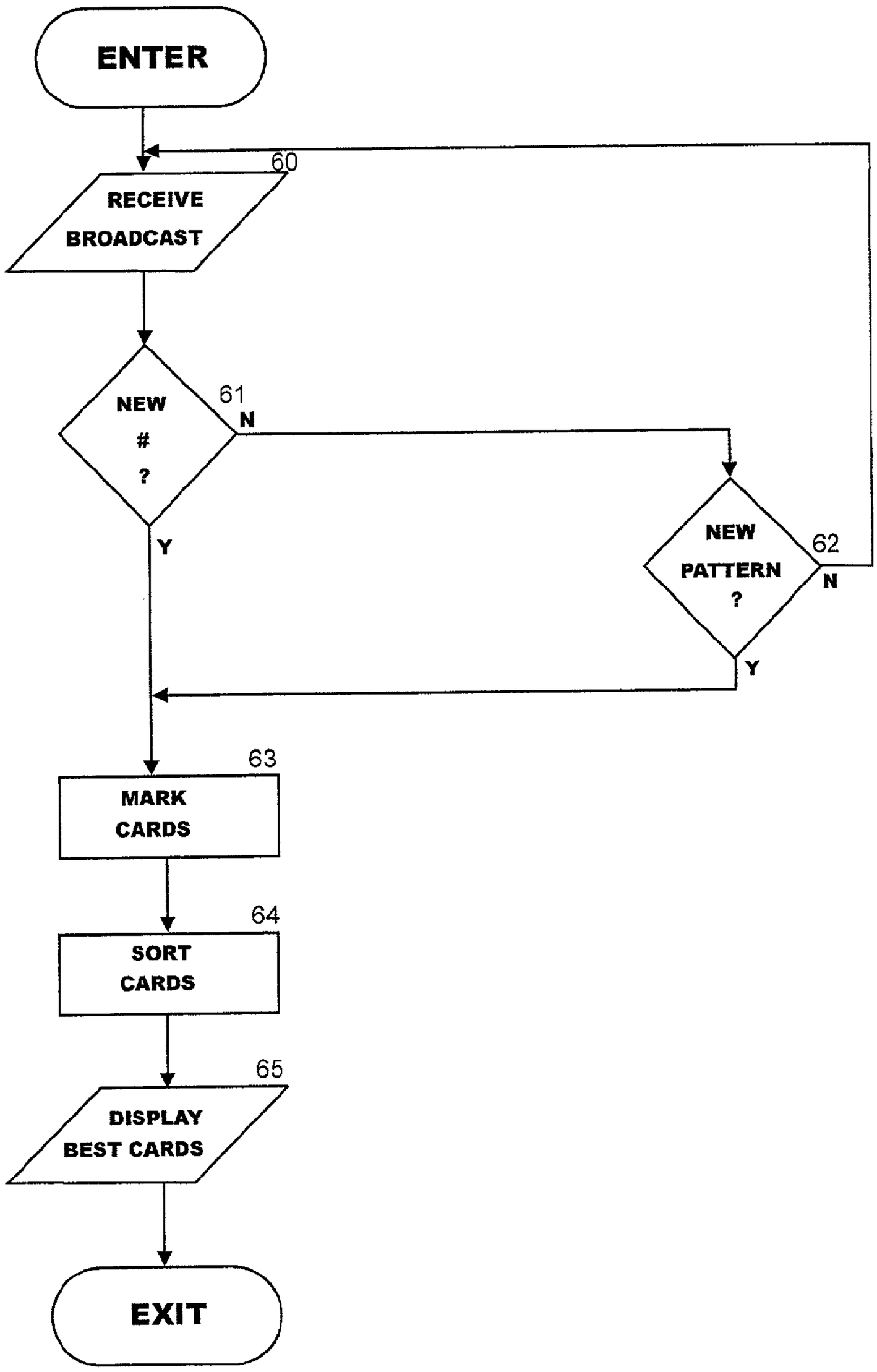

ENTER
60
RECEIVE BROADCAST
NEW # ?
61
N
Y
NEW PATTERN ?
62
N
Y
63
MARK CARDS
64
SORT CARDS
65
DISPLAY BEST CARDS
EXIT

Fig. 9

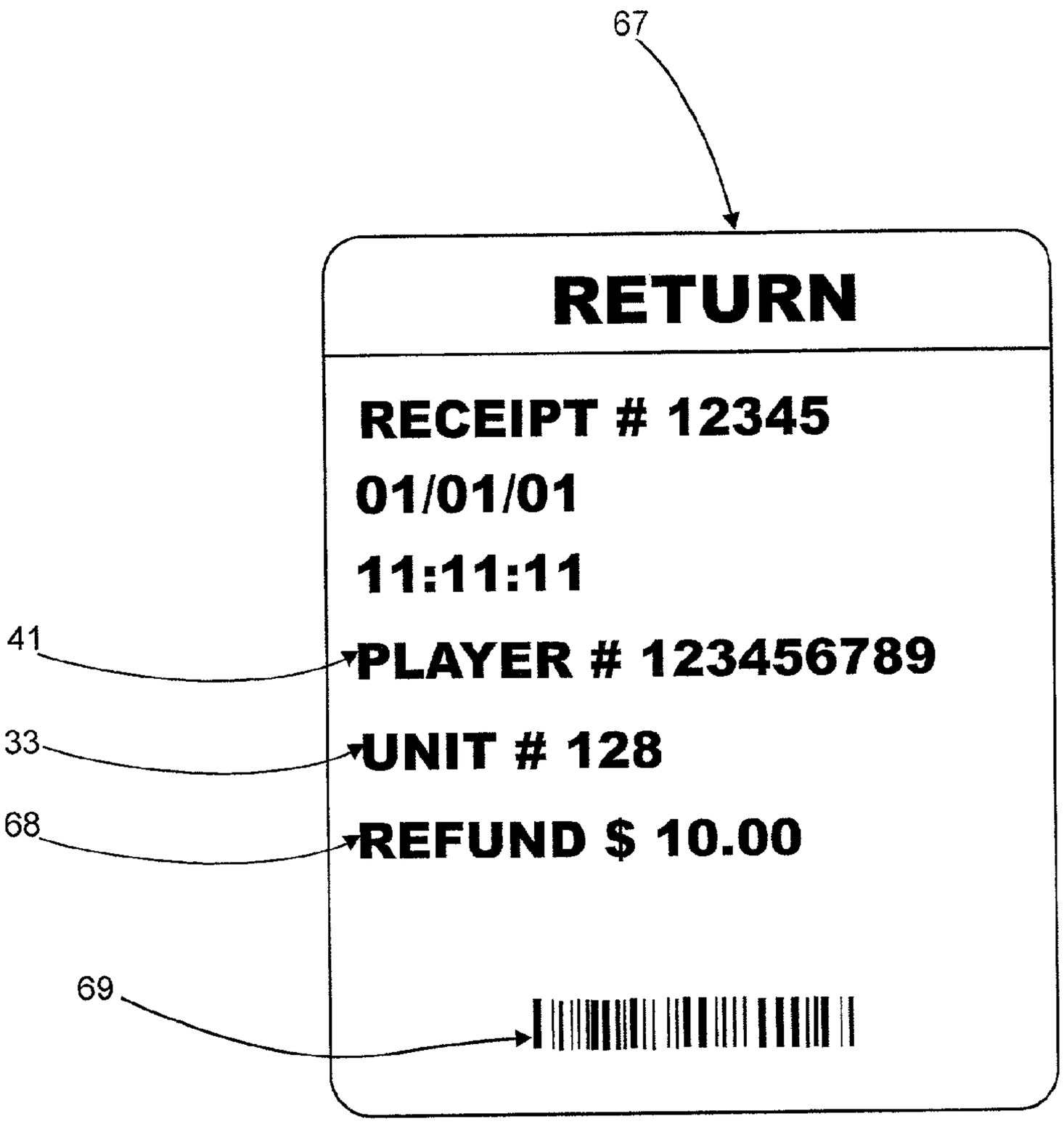

67
RETURN
RECEIPT # 12345
01/01/01
11:11:11
41
PLAYER # 123456789
33
UNIT # 128
68
REFUND $ 10.00
69

Fig. 10

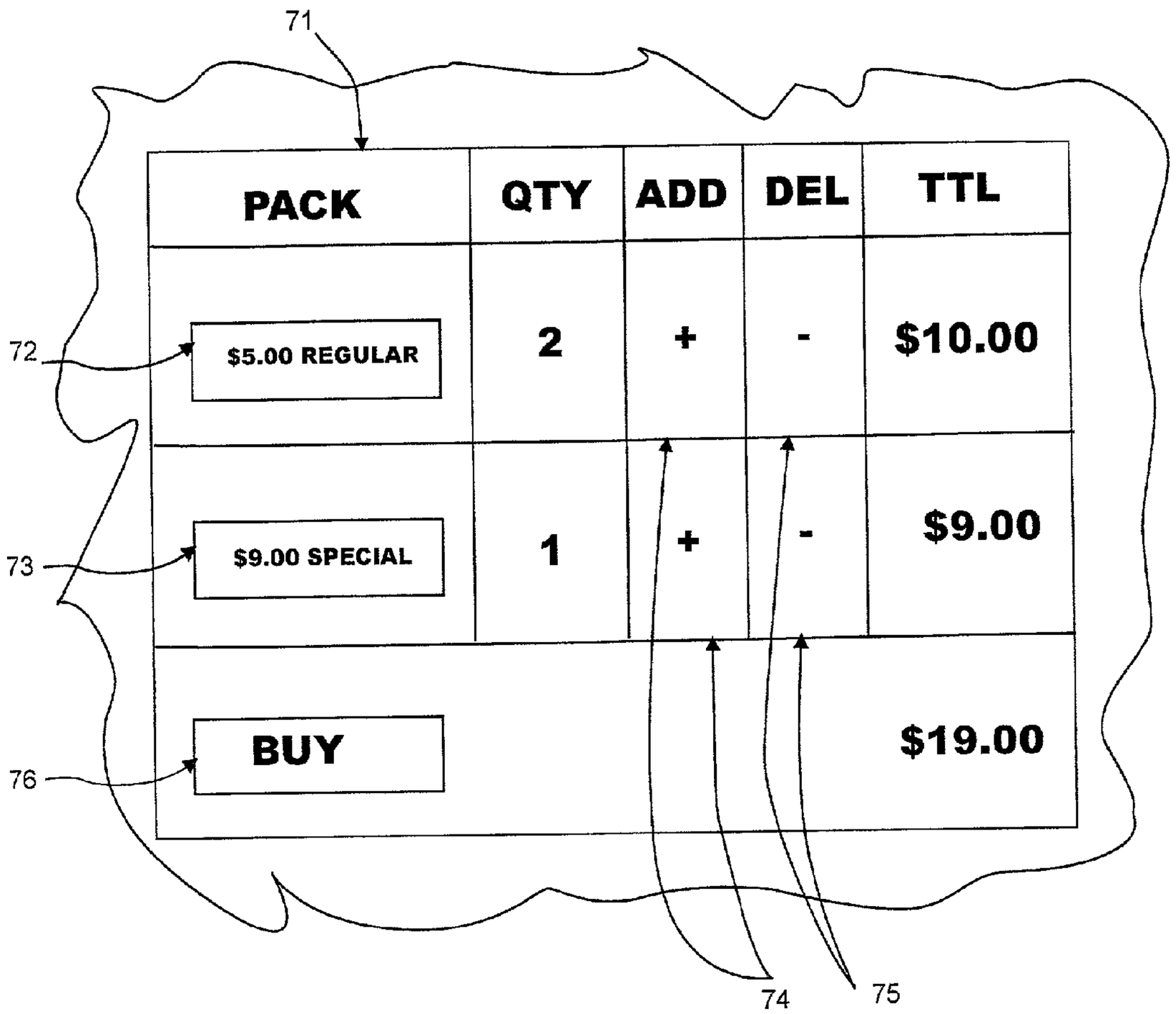

71
PACK
QTY
ADD
DEL
TTL
$5.00 REGULAR
2
+
-
$10.00
$9.00 SPECIAL
1
+
-
$9.00
BUY
$19.00
72
73
76
74
75

FIG. 11

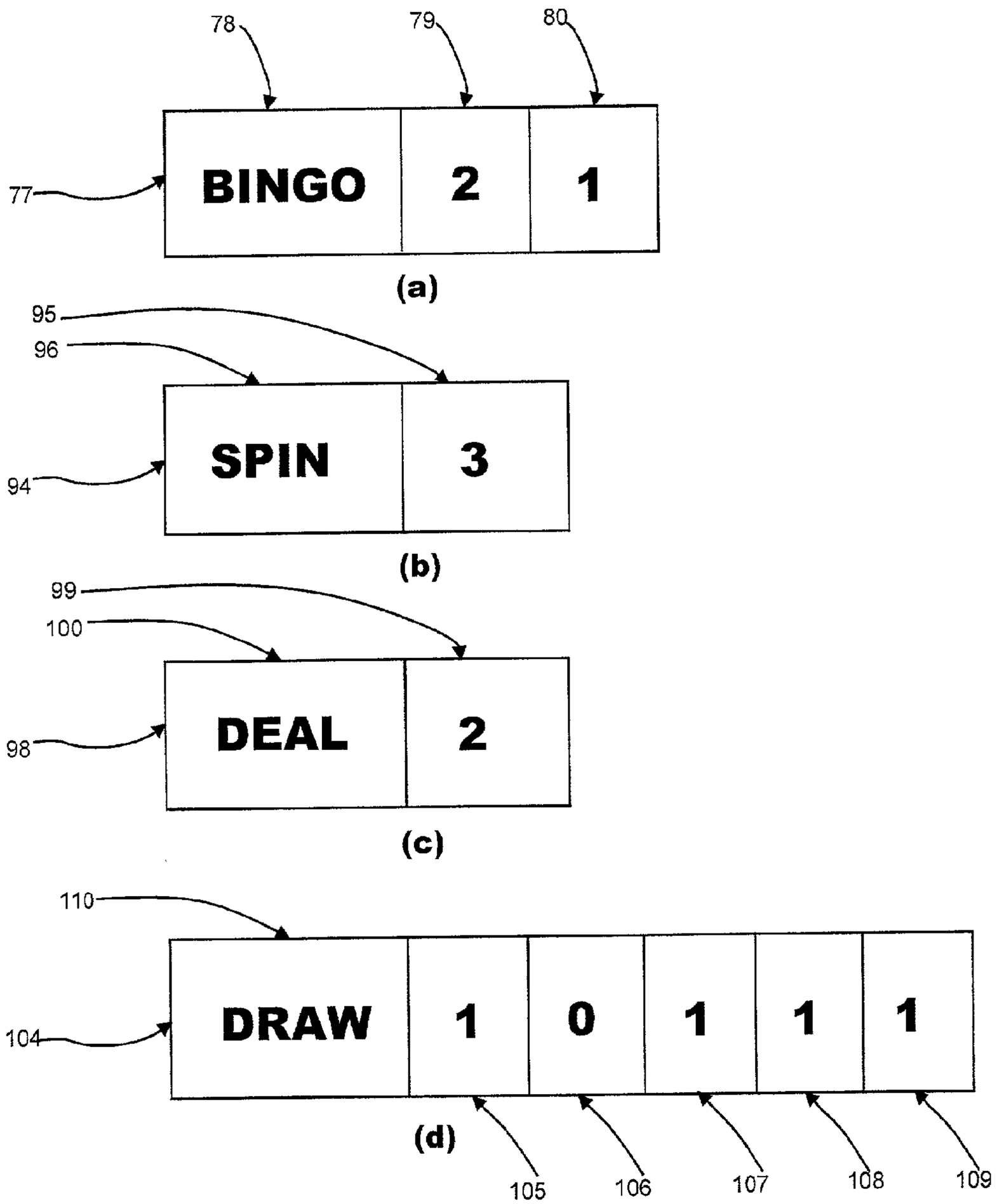
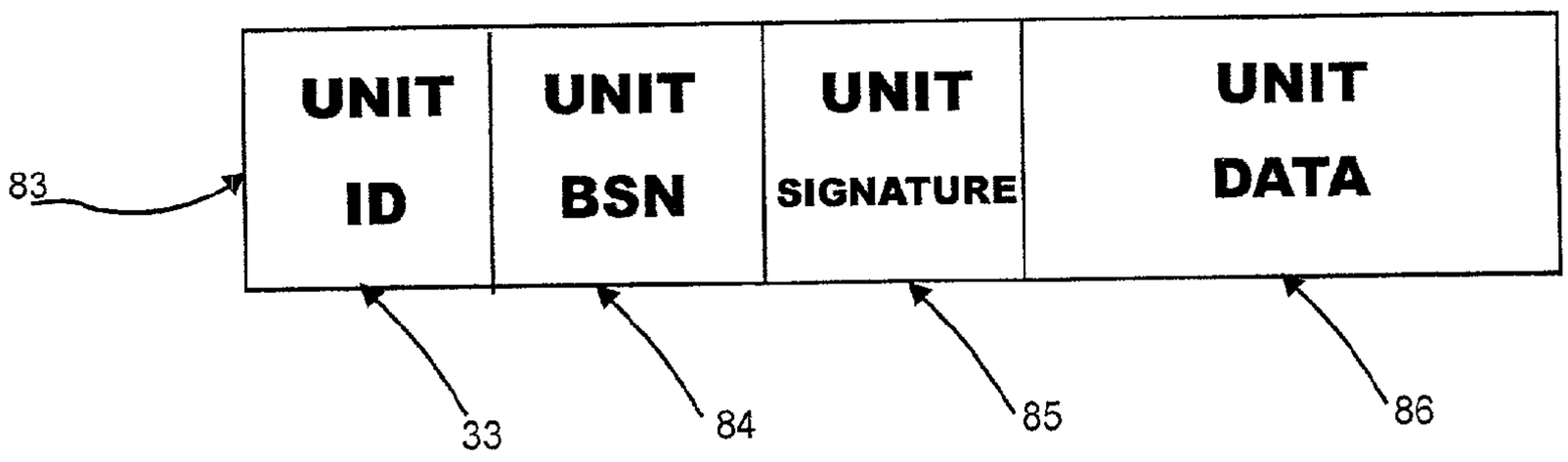
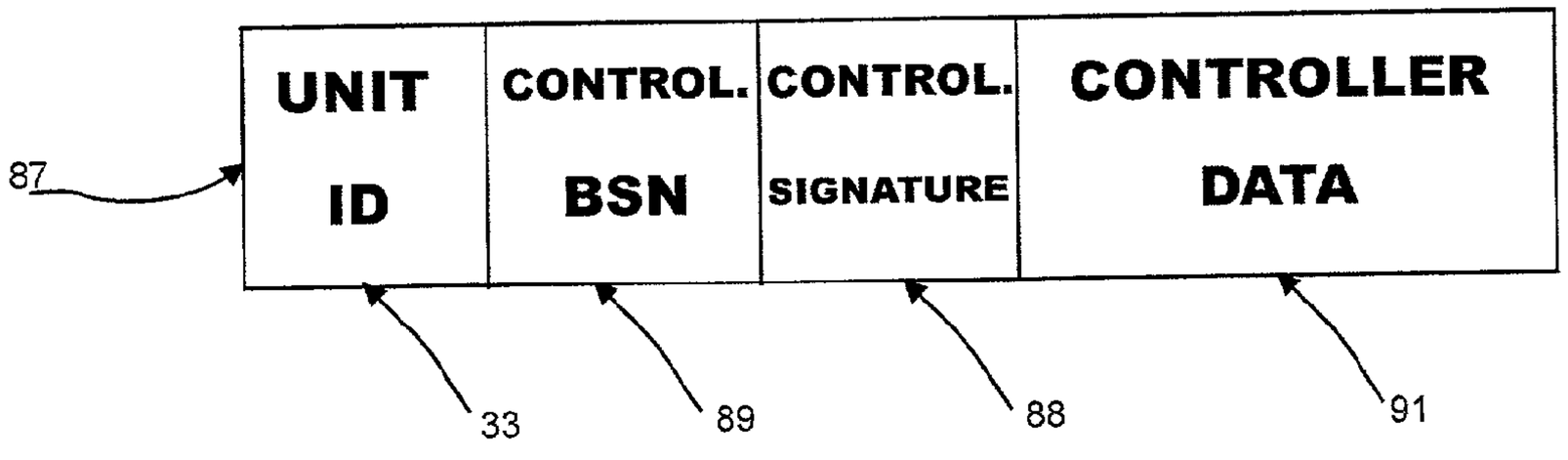

78
79
80
77
BINGO
2
1
(a)
95
96
94
SPIN
3
(b)
99
100
98
DEAL
2
(c)
110
104
DRAW
1
0
1
1
1
(d)
105
106
107
108
109

FIG. 12


83
UNIT ID
UNIT BSN
UNIT SIGNATURE
UNIT DATA
33
84
85
86

(a)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UNIT ID
CONTROL. BSN
CONTROL. SIGNATURE
CONTROLLER DATA
33
89
88
91

(b)

FIG. 13

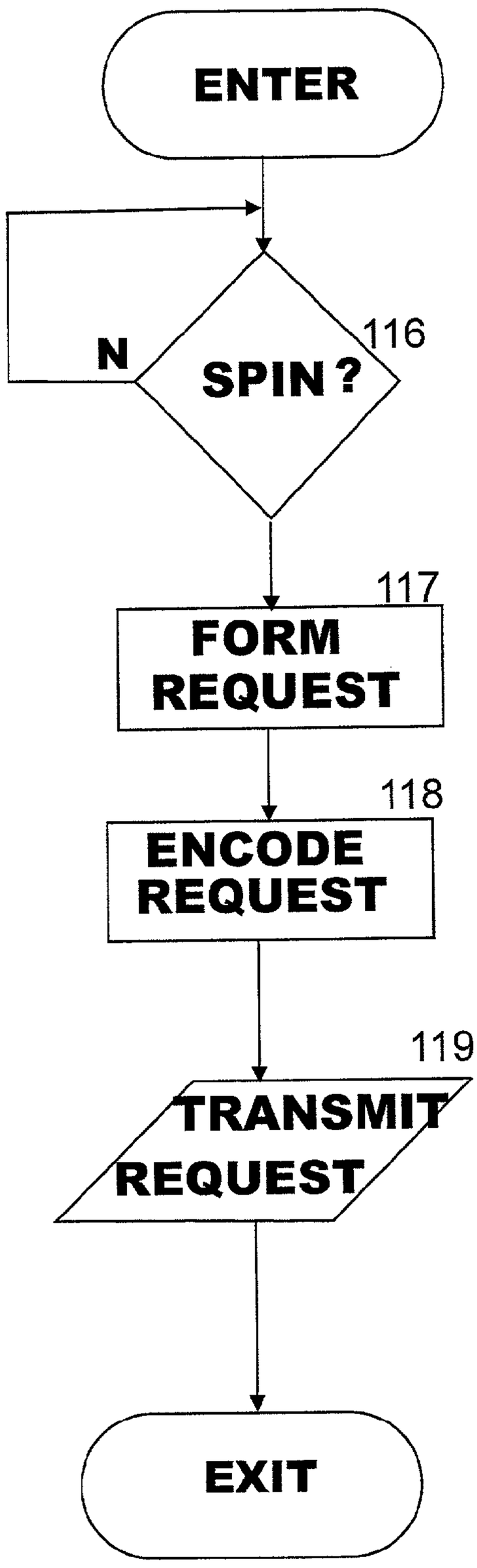
ENTER
N
SPIN ?
116
117
FORM REQUEST
118
ENCODE REQUEST
119
TRANSMIT REQUEST
EXIT

Fig.14

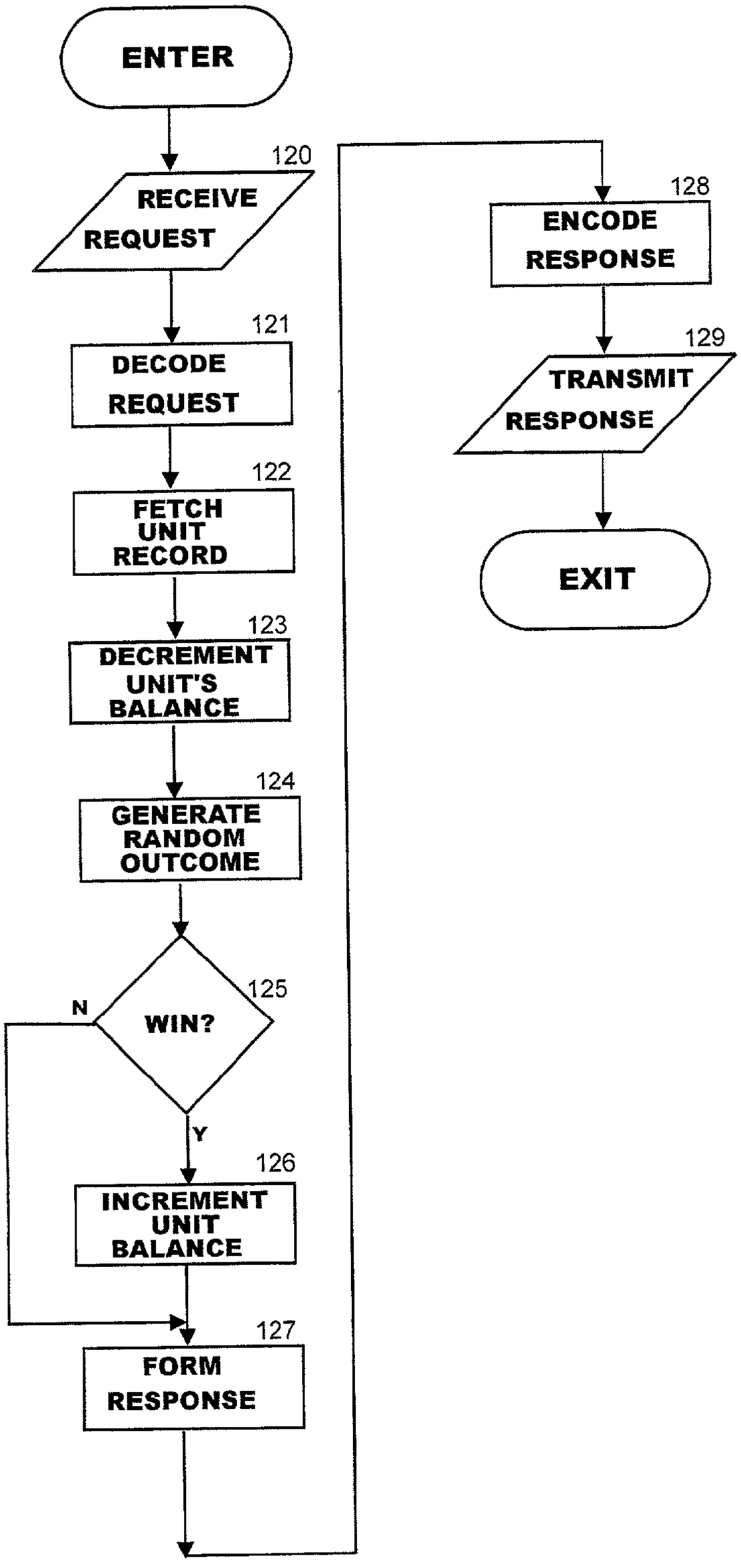
ENTER
120
RECEIVE REQUEST
121
DECODE REQUEST
122
FETCH UNIT RECORD
123
DECREMENT UNIT'S BALANCE
124
GENERATE RANDOM OUTCOME
125
WIN?
N
Y
126
INCREMENT UNIT BALANCE
127
FORM RESPONSE
128
ENCODE RESPONSE
129
TRANSMIT RESPONSE
EXIT

Fig. 15

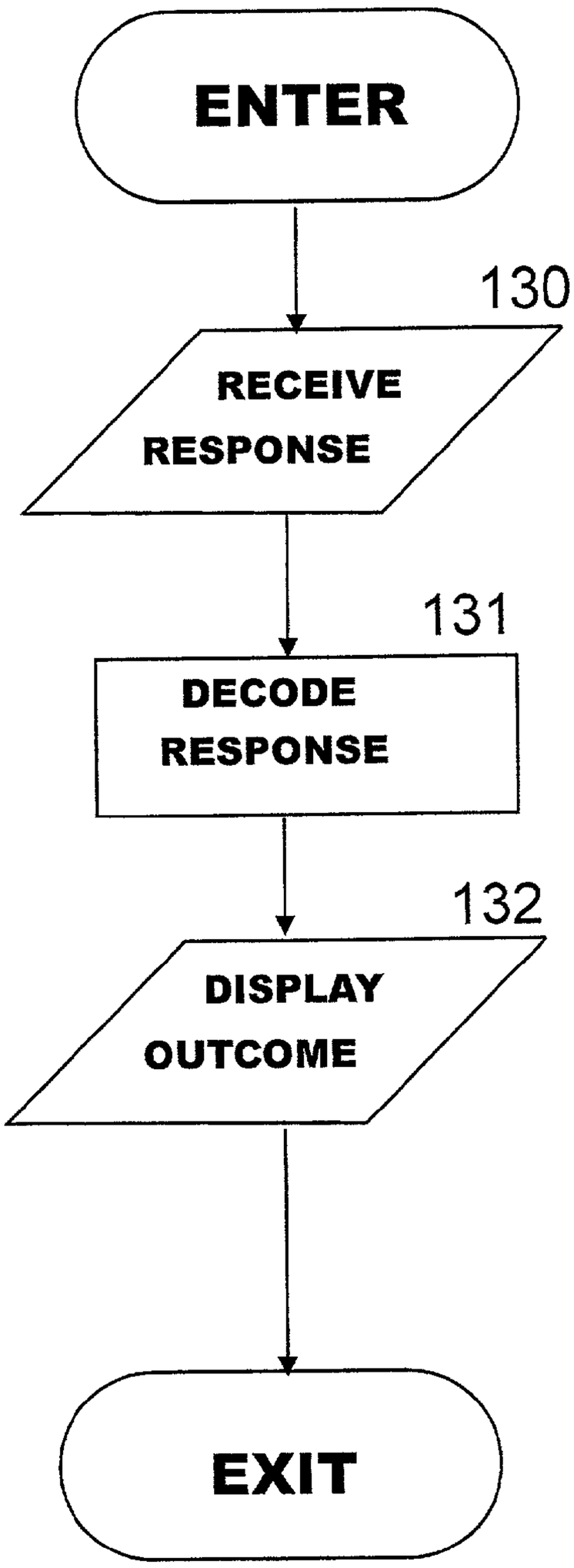
ENTER
130
RECEIVE RESPONSE
131
DECODE RESPONSE
132
DISPLAY OUTCOME
EXIT

Fig. 16

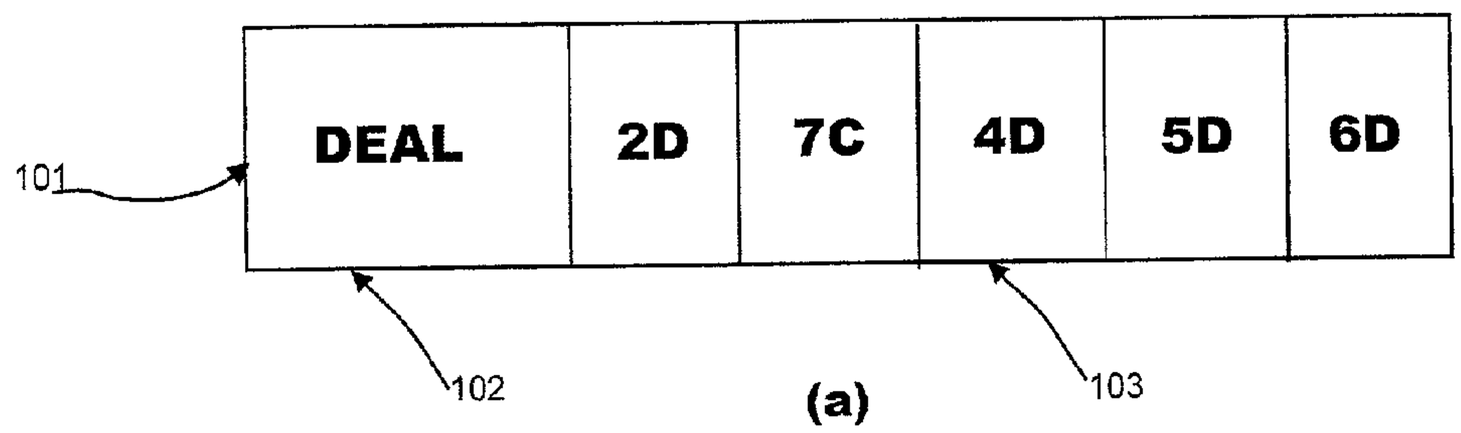
DEAL
2D
7C
4D
5D
6D
101
102
103
(a)
DRAW
0
3D
0
0
0
100
120
111
112
113
114
(b)

FIG. 17

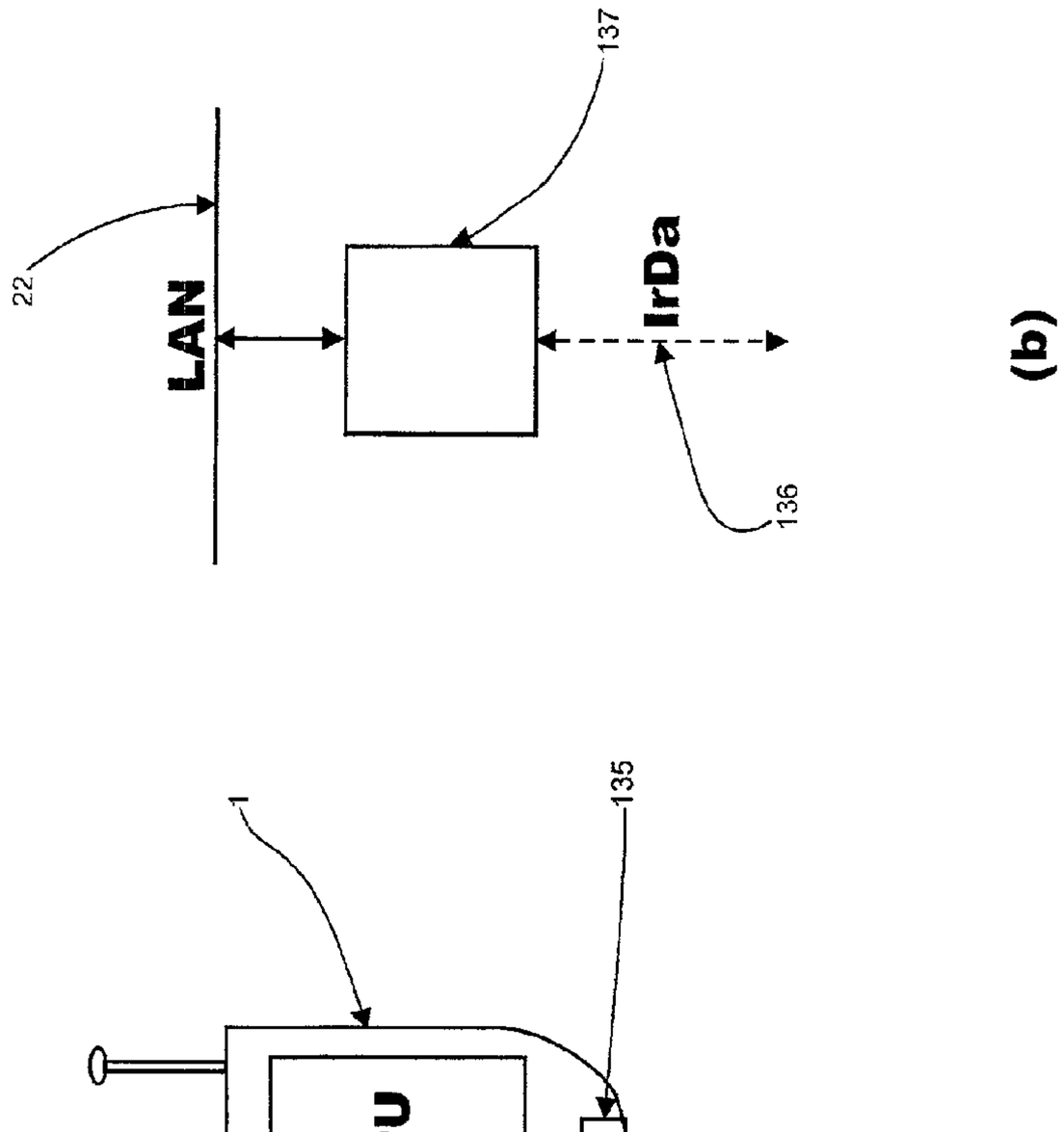

FIG. 18

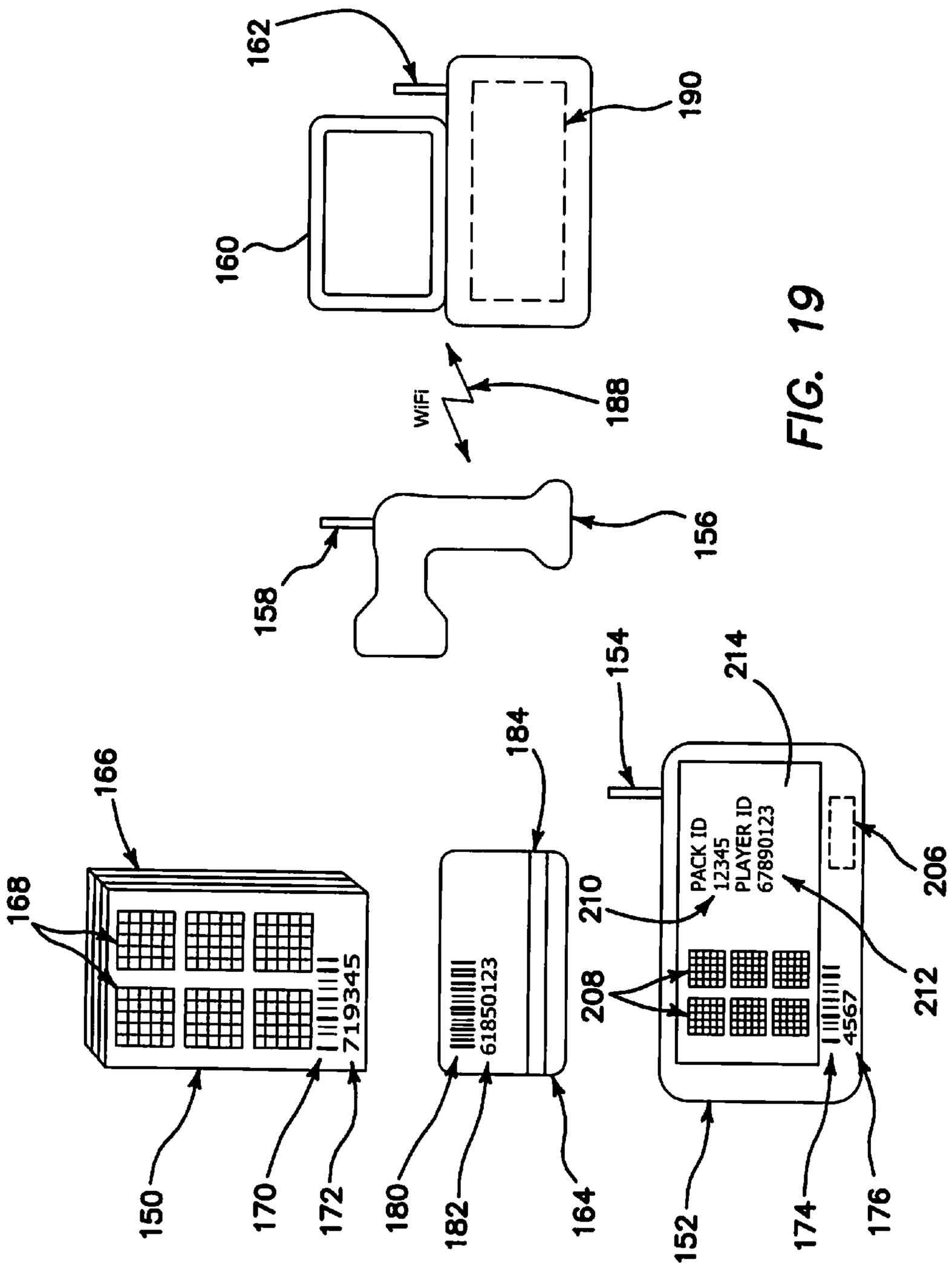
162
190
160
WiFi
188
158
156
154
214
184
166
168
PACK ID
12345
PLAYER ID
6789012
210
208
212
206
719345
61850123
4567
150
170
172
180
182
164
152
174
176

FIG. 19

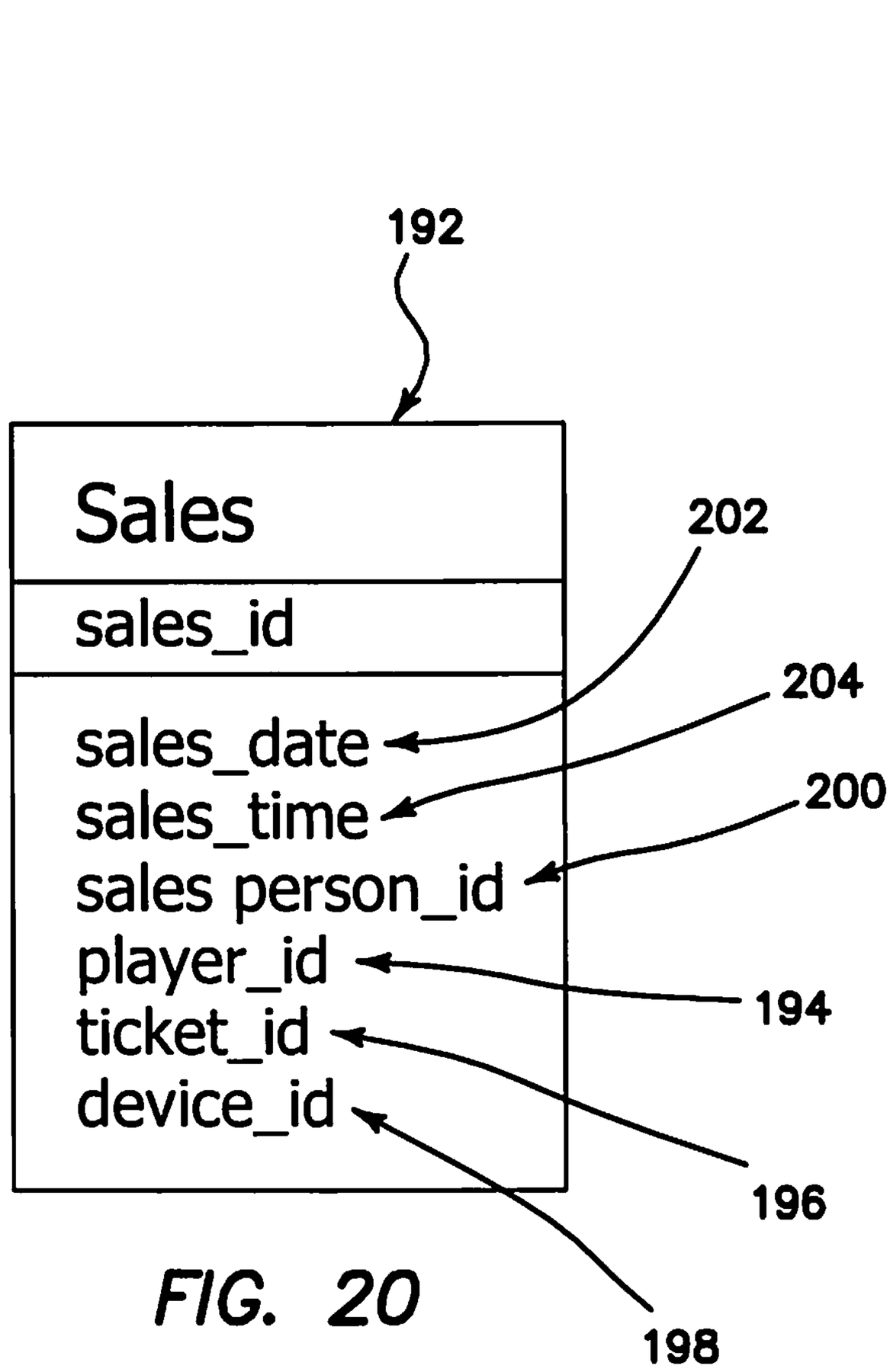
192
Sales
sales_id
sales_date
sales_time
sales person_id
player_id
ticket_id
device_id
202
204
200
194
196
198

FIG. 20

WIRELESS WAGERING SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. patent application Ser. No. 10/011,648; Filed Dec. 4, 2001 now abandoned, which is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

The present invention relates to gaming devices in general and, more specifically, to portable gaming devices suitable for use in gaming establishments such as casinos and bingo halls.

In recent years, radio-controlled hand-held or portable electronic bingo devices, such as disclosed in U.S. Pat. Nos. 4,455,025 and 4,624,462 both to Itkis and in bingo industry publications, including an article "Bingo Playing Enhanced With New Innovations", Bingo Manager, July, 2001, gained substantial popularity in casinos. However, mobile electronic bingo devices have limited applications in a casino environment and are labor-intensive because of the need to download bingo cards at a point-of-sale terminal operated by a cashier.

Recently, portable remote gaming devices were proposed for playing "classic" casino games such as poker, slots and keno. In particular, U.S. Pat. Nos. 6,012,983 and 6,001,016 both to Walker, et al., propose to utilize pager-like devices for remote monitoring of the progress of a slot game executed automatically on a player's behalf on an actual slot machine available at a "casino warehouse." However, Walker limits play to a rather passive observation of the game and, therefore, diminishes a player's interest in the game. Besides, Walker's approach requires a costly investment in real slot machines located remotely at a "casino warehouse." In addition, Walker does not provide any mechanism for facilitating the labor-intensive process of distributing gaming devices to players and does not assure security of the gaming devices. A commercial implementation of remote playing on a "warehoused" slot machine by GameCast Live as disclosed in "Expanding Casino Borders", International Gaming and Wagering Business, September 2001, suffers from the same deficiencies as Walker's disclosures. Moreover, although GameCast Live offers players convincing video and audio data streams originating at video cameras aimed at actual slot machines, such implementation is labor intensive and requires costly hardware. In addition, such an approach cannot provide a casino with an adequate number (e.g., several hundred) of remote wagering devices since the overall radio frequency (RF) bandwidth available for a casino is severely limited.

On the other hand, a cellular telephone-based approach to remote gaming being promoted by companies, such as Motorola, Inc., TRIMON Systems, Inc. and NuvoStudios, Inc., as disclosed, for example, in "NuvoStudios, Inc., Corporate Profile", NuvoStudios, Inc., October 2001 and "Mobile Casino Solution", TRIMON Systems, Inc., October 2001, does alleviate the issue of available radio frequency bandwidth. Yet, remote gaming on cellular telephones is functionally indistinguishable from gaming on the Internet. Although casinos are tempted by the lucrative prospects of Internet gaming, such as described in U.S. Pat. Nos. 5,800,268 to Molnick, 5,999,808 to La Due and 5,779,545 to Berg et al., the disclosed Internet wagering techniques cannot be directly transplanted into casino environment because of the vast differences between the security and integrity requirements of "brick-and-mortar" casinos and "click-and-mortar" casinos. While there is no conceivable motivation for an Internet player to sabotage his or her own personal computer (PC), telephone or mobile Personal Digital Assistant (PDA), an unscrupulous player will not hesitate to subvert a casino slot machine. In addition, a potentially unscrupulous player is thwarted from cheating on the Internet by the fear of violating a vast plethora of laws and regulations aimed to prevent wire fraud and credit card fraud. In comparison, the intra-casino operation of slot machines is typically outside of purview of such anti-fraud laws. Being functionally equivalent to gaming on stationary Internet terminals, wireless gaming on Internet-enabled phones and PDAs suffers from the same serious security and integrity deficiencies that are inherent in stationary Internet terminals.

In many modern electronic bingo systems, such as disclosed on the website having URL www.fortunet.com, players buy electronic and/or paper bingo cards at a point of sale terminal (such as described in our co-pending U.S. Patent Application No. 2003/0104865) that issues a sales receipt to a purchaser of bingo cards. The receipt typically includes a receipt identification number and may also include a barcode that uniquely identifies the receipt. The player then enters such an identification number into a bingo player unit, e.g., a wireless bingo player unit, and in response, the player unit relays the entered identification number to a central file server, which in its turn, downloads bingo cards corresponding to the receipt identification number into the player unit. However, the manual entry of the identification number by the player is error prone, cumbersome and not conducive to assuring the security and integrity of bingo cards sales by roving cashiers on the floor of the bingo hall. Moreover, the sales of bingo cards to players by roving cashiers are not currently tracked by any means and consequently, players lose the opportunity to earn player loyalty points for purchasing bingo cards on the bingo hall floor while bingo hall operators lose a valuable opportunity to track the purchasing activities of players.

SUMMARY OF THE INVENTION

It is the primary objective of the embodiments of the present invention to provide a casino player with an opportunity to securely play casino games, such as poker, slots, keno and bingo "on the go" without the need for a stationary video and/or reel slot machine.

It is a further objective of the embodiments of the present invention to provide a casino player with a secure method of playing a mobile casino game on a small device convenient for carrying on the person.

It is a further objective of the embodiments of the present invention to automate the process of renting such mobile wagering devices to players.

It is a further objective of the embodiments of the present invention is to automatically track mobile player devices rented to players to encourage the return of the devices to the casino.

It is yet another objective of the embodiments of the present invention to facilitate player tracking and simplify and make more reliable the process of downloading bingo card data into bingo player units.

These and further objectives will become apparent from the attached drawings and the following description of the preferred embodiment.

The above objectives are achieved through the embodiments of the present invention by providing a casino player with a wireless wagering device akin to a wireless PDA or an Internet-enabled cellular telephone. The preferred embodi-

ment of a mobile wagering device, programmed to play typical casino games, including poker, slots, keno and bingo, incorporates a radio frequency transceiver, an infrared downloading port and a rechargeable battery. A player rents such a mobile player unit from the casino at a self-service dispensing kiosk. In order to rent a mobile player unit, a player inserts a player club card into the kiosk's magnetic card reader and deposit money into the kiosk's bill validator The kiosk houses a number of mobile player units in its storage and recharging cells. Each of the cells are networked over a local area network with a central PC-compatible computer controlling the kiosk.

When a player buys a pack of electronic bingo cards at a kiosk, the kiosk's central computer downloads the purchased bingo cards into an available player unit plugged into the internal local area network of the kiosk while the unit is housed in the kiosk. A player can then take the downloaded unit out of the kiosk to any location of the casino floor. Over a radio channel, the unit receives bingo data, such as bingo patterns and pseudo-random bingo numbers from the kiosk's central computer, and plays downloaded bingo cards automatically. The central computer automatically verifies all bingo cards downloaded into all rented mobile player units, detects winning bingo cards, computes the prizes due to the winning players and stores the outcomes of the games in an internal database. When a player re-inserts the player unit into the kiosk, the kiosk automatically dispenses any winnings due the player through a bill dispenser and/or coin hopper.

The central computer also maintains a database of the rented units and may award bonus points to players returning the rented units to the kiosk. A complete self-service rent-and-return cycle yields substantial labor costs savings for casinos. The kiosk is also equipped with electronic latches controlled by the central computer. The latches lock the unit inside the kiosk and prevent a player from taking the unit out of the kiosk without first paying for the unit.

A player having a sufficient account balance can also purchase, by means of radio communications, bingo cards with the help of the mobile player unit located on the casino floor. In order to prevent fraud and make radio communication with the unit secure, the central computer downloads an encryption key to each unit being rented. The encryption key is downloaded over the kiosk's internal local area network while the unit remains locked inside of the kiosk. Even though a radio communication can be easily intercepted, such an internal downloading of the encryption key assures security of the subsequent communications between the central computer and the rented unit over the public radio channel. As a result, a player can confidently place an order for purchasing bingo cards right from the casino floor in real time.

Moreover, secure gaming over a public radio channel authenticated by an encryption key downloaded at a dispensing kiosk opens an opportunity for playing "classic" casino games, such as poker and slots, on the very same mobile player unit. In this case, the player unit transmits authenticated encoded game requests, such as "deal a poker hand", "spin reels" and "draw keno balls", to the central computer. In response, the central computer broadcasts authenticated outcomes of the games determined by a software random number generator running on the central computer. The response received by the player unit determines the outcome of the game including winnings, if any, and a new credit balance. Each such request and response thereto are authenticated by digital signatures based upon a secure authentication key downloaded into the player unit from the central computer while the player unit remains inside the dispensing kiosk.

The objective of facilitating player tracking, and simplifying and making more reliable the process of downloading bingo card data into bingo player units is accomplished in one embodiment by imprinting a game ticket, such as a bingo card, with a first barcode and by affixing a barcode label carrying a second barcode to a game unit utilized by a player to play a gambling game, such as bingo, and additionally, by reading said first and said second barcodes via a barcode reader, such as a wireless barcode reader, and transmitting said first and second read barcodes to a central game server that processes said received first and second barcodes to derive gaming data pertinent to said game ticket, such as bingo numbers of said bingo card, and subsequently, transmits said game data to said game unit which processes said game data and displays results of the processed game data to a player operating said game unit.

Other variations, embodiments and features of the present invention will become evident from the following detailed description, drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is illustrated by the following drawings:

FIG. **1** illustrates a block diagram of the preferred embodiment of the present invention;

FIG. **2** illustrates a local area network of the embodiments of the present invention;

FIG. **3** illustrates a block diagram of a player unit of the embodiments of the present invention;

FIG. **4** illustrates a locking mechanism of the embodiments of the present invention;

FIG. **5** illustrates a status table of the embodiments of the present invention;

FIG. **6** illustrates a player-tracking card of the embodiments of the present invention;

FIG. **7** illustrates a rental receipt of the embodiments of the present invention;

FIG. **8** illustrates a flowchart of a "dispense unit" task of the embodiments of the present invention;

FIG. **9** illustrates a flowchart of a "verify" task of the embodiments of the present invention;

FIG. **10** illustrates a return receipt of the embodiments of the present invention;

FIG. **11** illustrates a "buy pack" window of the embodiments of the present invention;

FIG. **12** (*a*) illustrates a "bingo request" data block of the embodiments of the present invention;

FIG. **12** (*b*) illustrates a "spin request" data block of the embodiments of the present invention;

FIG. **12** (*c*) illustrates a "deal request" data block of the embodiments of the present invention;

FIG. **12** (*d*) illustrates a "draw request" data block of the embodiments of the present invention;

FIG. **13** (*a*) illustrates a "service request" data block of the embodiments of the present invention;

FIG. **13** (*b*) illustrates a "service response" data block of the embodiments of the present invention;

FIG. **14** illustrates a "initiate spin" task of the embodiments of the present invention;

FIG. **15** illustrates a "determine outcome" task of the embodiments of the present invention;

FIG. **16** illustrates a "display outcome" task of the embodiments of the present invention;

FIG. **17** (*a*) illustrates a "deal" data block of the embodiments of the present invention;

FIG. **17** (*b*) illustrates a "draw" data block of the embodiments of the present invention;

FIG. **18** (*a*) illustrates a lateral communication between two player units via an infrared port of the embodiments of the present invention;

FIG. **18** (*b*) illustrates an infrared communication via a local area network of the embodiments of the present invention;

FIG. **19** illustrates a player tracking and bingo card downloading system according to the embodiments of the present invention; and

FIG. **20** illustrates a database table according to the embodiments of the present invention.

DETAILED DESCRIPTION

As illustrated in FIG. **1**, a preferred embodiment of the present invention includes two main elements, namely, a mobile player unit (MPU) **1** and a unit dispenser kiosk (UDK) **2**. Specifically, FIG. **1** shows three mobile player units **1** located outside dispenser kiosk **2** and fifteen mobile player units **1** located inside kiosk **2**. It is presumed that mobile player units **1** located outside of kiosk **2** are rented to players and that the units **1** located inside kiosk **2** are generally available for rent. The rented units **1** are shown with their touchscreen liquid crystal displays (LCD) **3** facing the reader and with their radio-frequency (RF) antennae **4** extended, whereas mobile player units **1** inside kiosk **2** are shown positioned on their sides **5** with antennae **4** retracted into respective units **1**. FIG. **1** also illustrates that MPU **1** is equipped with control pushbuttons **6**, a charger and communications connector **7** and a "UNIT READY" light emitting diode (LED) **8**. LCD **3** of a first rented unit **1** displays an image of a bingo card, while LCD **3** of a second rented unit **1** displays an image of slot reels, and LCD **3** of a third rented MPU **1** displays an image of poker cards. Although only a few mobile player units **1** are shown in FIG. **1**, a typical casino is expected to have hundreds of rental MPU **1** available for its patrons and is expected to be equipped with several UDKs **2** networked together.

Being a combination kiosk-type dispenser of MPUs **1** with a central game controller, UDK **2** includes an assortment of conventional point-of-sale and automatic-teller-machine components, including a touchscreen video monitor **9**, a receipt printer (PRT) **10**, a magnetic card reader (MCR) **11**, a bill validator/barcode-reader (BV) **12** a bill dispenser (BD) **13** and a coin dispenser CD **14**. In addition, UDK **2** incorporates a RF antenna **15** being a part of an embedded RF transceiver **16** shown explicitly in FIG. **2**. The UDK **2** includes a plurality of storage cells **17**. Each storage cell **17** is capable of housing one MPU **1**. In addition, each storage cell **17** is capable of recharging and communicating with the MPU **1** housed therein. Specifically, FIG. **1** shows thirty cells **17** arranged in three rows of ten cells **17** each. Some illustrated cells **17** are occupied by units **1** and some cells **17** are empty as some MPUs **1** have been rented. Although FIG. **1** explicitly shows only thirty storage cells **17**, a typical UDK **2** may incorporate more or less than thirty cells **17**.

The internal design of an MPU **1** is illustrated in FIG. **3**. Being essentially a wireless PDA, unit **1** incorporates touchscreen LCD **3**, antenna **4**, LED **8**, connector **7**, control buttons **6**, a programmable microprocessor **18**, such as a Dragon-Ball-Z® microprocessor, a spread-spectrum RF transceiver **19**, such as a BlueTooth® transceiver and a speaker **20**. Also incorporated within the internal design of an MPU **1**, but not shown explicitly in FIG. **3**, are conventional dynamic and non-volatile memory and a rechargeable battery.

The internal design of UDK **2** is detailed in FIG. **2**. Architecturally, UDK **2** is a local area network (LAN) **22** governed by a conventional personal computer (PC) **21**. The internal components of UDK **2** are interfaced with each other via LAN **22**. In particular, PC **21**, BV **12**, MCR **11**, PRT **10**, BD **13**, and CD **14** are permanently plugged into LAN **22**. An MPU **1** temporarily occupying cell **17** is interconnected with LAN **22** via its own connector **7** and a mating charging and communication connector **23** on the end of cable **24** that forms a branch of LAN **22**. Connector **23** is built into cell **17** as shown in FIG. **4**. LAN **22** also includes cables **25** through **30** forming branches of LAN **22** interfacing respectively with PC **21**, BV **12**, MCR **11**, PRT **10**, BD **13** and CD **14**. In addition, LAN **22** is wirelessly interfaced with rented MPUs **1** via a spread-spectrum RF channel **31**, preferably, a public domain RF channel. More specifically, PC **21** incorporates a spread-spectrum transceiver **16** (shown in dashed lines) identical to the spread-spectrum transceiver **19** of MPU **1** and an antenna **15** identical to the antenna **4** of MPU **1**. Via transceivers **16** and **19** and antennae **4** and **15**, LAN **22** is wirelessly interfaced with MPU **1** over a spread-spectrum RF channel **31**.

FIG. **4** illustrates three neighboring cells **17** of UDK **2**. The leftmost cell **17** and the central cell **17** are occupied by MPUs **1**, whereas the rightmost cell **17** is empty. As shown in FIG. **4**, each storage cell **17** includes a battery charger and communications connector **23**, for mating with connector **7** of MPU **1**, and an electromechanical lock formed by a spring-loaded solenoid **134** (the spring is not explicitly shown in FIG. **4**.) having a solenoid rod **32**. The leftmost cell **17** shows solenoid **134** in a deactivated state with its rod **32** being forced out by the spring and, consequently, MPU **1** being locked inside the leftmost storage cell **17**. The central storage cell **17** shows solenoid **134** in an active state with its rod **32** retracted and, consequently, MPU **1** being released. The mechanics of solenoid **134** are such that its rod **32** allows for easy insertion of MPU **1** into cell **17** but precludes removal of MPU **1** from cell **17** without activation of solenoid **134**. Although not shown explicitly, each storage cell **17** also includes charging circuitry for charging MPU **1** while it is inserted into storage cell **17**.

Via LAN **22**, PC **21** periodically polls all cells **17** of UDK **2** to determine whether they are occupied and, if so, by which MPU **1**. Note that each MPU **1** is characterized by its unique manufacturer's identification number **33** stored in its non-volatile memory and further etched on the top surface **34** of MPU **1** as shown in FIG. **1**. In particular, PC **21** periodically sends a test data block to each occupied cell **17** via respective communication connectors **23** and **7**. In response to the received test block, MPU **1** residing in a particular cell **17** sends an acknowledgment containing its manufacturer's identification number **33** to PC **21** via embedded connector **7**. The conventional details of the test and acknowledgment data blocks flowing between MPU **1** and PC **21** are omitted herewith as they are well known to practitioners of the art. Once PC **21** receives a positive acknowledgment from MPU **1**, it marks, in its memory, the respective cell **17** together with MPU **1** residing therein as available for dispensing to a player. Specifically, PC **21** maintains in its memory a status table **35** illustrated in FIG. **5**. The status table **35** details the current status of each cell **17**, each MPU **1** and each casino patron renting an MPU **1**. Each row of table **35** presents status of an individual cell **17**. Specifically, the first group **36** of thirty rows represents the current status of thirty individual cells **17**. The individual cells **17** in table **35** are indexed by the cell identification number **37**. The top leftmost cell **17** of FIG. **1** is identified as cell number one (1) and the bottom rightmost cell **17** of FIG. **1** is identified as cell number thirty (30). For each storage cell **17**, table **35** indicates the manufacturer's identification number **33** of mobile player unit **1** housed therein and

the current status **38** of MPU **1** located in the cell **17**. The current status of each MPU **1** stored in a cell **17** is indicated by status flag **38** that is equal to one, if respective cell **17** houses an MPU **1** ready for dispensing, and is equal to zero otherwise.

Players rent MPUs **1** from UDK **2** and return MPUs **1** to UDK **2** once they complete playing. In order to rent an MPU **1** from UDK **2**, a player is preferably required to first insert into MCR **11** a player tracking card **39** as illustrated in FIG. **6**, otherwise no MPU **1** should be dispensed by UDK **2** to the player. Along with a player's name **40**, card **39** bears a player's identification number **41**. For purposes of brevity, a player having identification number **41** may simply be called player **41** throughout the remainder of the disclosure. The name **40** and identification number **41** may also be encoded in a magnetic form on magnetic strip **42** and may also be available in a barcode format **43**. In order to rent a player unit, a player must, in addition to inserting player card **39** into MCR **11**, also deposit money into BV **12**.

Initially, in order to facilitate the description of the operation of the system, a simple case of a player renting an MPU **1** to play a prepackaged set of electronic bingo cards ("pack") is considered. For example, it is assumed that a casino offers players only one type of bingo packs and allows players to buy only one pack. A specific bingo pack sold to a player **41** is identified on a rental receipt **44** issued by PRT **10** as illustrated in FIG. **7**. Note that manufacturers of paper and electronic bingo packs design their packs in such a way that each bingo pack contains predetermined bingo cards and each bingo pack is identifiable by its manufacturer's pack identification number **100**. To determine each and every bingo card to be played by player **41** in each and every bingo game of a bingo session for which pack **43** is intended, it is sufficient to know the pack identification number **100**. The reverse is also true where duplicate bingo cards are not allowed in any game.

The operations being performed by PC **21** of UDK **2** in this simplified case are illustrated in the flowchart of FIG. **8** illustrating a "dispense unit" task. Note that PC **21** operates in a multitasking environment, such as Linux®, and executes multitasking applications software. In accordance with the instructions **120** displayed on the touchscreen monitor **9**, a player starts by inserting a player card **39** into magnetic card reader **11**. MCR **11** detects the inserted player card **39** and transfers a player identification number **33** over LAN **22** to PC **21** as illustrated by the step "READ PLAYER CARD" **45** of the flowchart in FIG. **8**. Subsequently in the step "FETCH PLAYER RECORD" **46**, PC **21** attempts to fetch the current player record by matching the read-in player identification number **33** from the status table **35**. Techniques of searching databases are well known in the industry and, therefore, not described in detail herein. If as a result of the test "VALID RECORD?" **47**, a matching record is not found in table **35**, PC **21** returns to step **45** of reading player card **39**. If test **47** is passed successfully, PC **21** begins to poll BV **12** in step "POLL VALIDATOR" **48**. If a bill is indeed inserted, then the test "BILL IN?" **49** is deemed successful, and the player's balance **57** that is stored in status table **35** is incremented according to the denomination of the bill in step "INCREMENT PLAYER'S BALANCE" **50**. Assuming the resulting balance **57** is sufficient to purchase a bingo pack, the test "SUFFICIENT BALANCE?" **51** is satisfied and PC **21** proceeds to the next step "SELECT UNIT" **52**, otherwise PC **21** loops back to step **48**. Excess deposited funds, if any, are credited to player's account balance **57**. While performing step "SELECT UNIT" **52**, PC **21** scans table **35** and finds the next available MPU **1** ready for operation. The located MPU **1** is downloaded with purchased electronic bingo cards in the step "DOWNLOAD CARDS" **53**. As techniques of downloading electronic player units with bingo cards are well known in the industry, they are omitted herein. Instead, it is emphasized that bingo cards are downloaded into MPU **1** via a secure, private communication channel formed by connectors **7** and **23**. Note that communications via connectors **7** and **23** are not susceptible to interception, whereas communications via public radio channel **31** can be easily intercepted. Subsequently, PC **21** updates a record of player **41** (more exactly, a player having identification **41**) in status table **35** in the step "UPDATE PLAYER RECORD" **54**. In particular, PC **21** updates a player's credit balance **57** to reflect the payment for the purchased bingo pack **43** and also links the record of player **41** with the manufacturer's identification number **33** of MPU **1** downloaded with pack **43**. At this point, PC **21** causes PRT **10** to print rental receipt **44** including player identification number **41**, identification number **33** of the rented MPU **1**, identification number of the downloaded pack **43**, receipt identification number **58** and receipt identification barcode **59**. Barcode **59** uniquely encodes the information printed on receipt **44**. PRT **10** prints receipt **44** in a format compatible with the built-in barcode reader of BV **12** so that the BV **12** can read barcode **59**. Lastly, PC **21** activates solenoid **134** of the cell **17** containing the downloaded MPU **1** in the step "RELEASE UNIT" **56** as is illustrated by the central cell **17** in FIG. **4**. Now, a player can remove MPU **1**, carrying the downloaded information, from a respective cell **17**. In order to assist the player in finding the MPU **1**, the MPU **1** starts blinking its LED **8** as soon as it detects the end of the process of downloading of, via connectors **7** and **23**, pack **43** by PC **21**.

Once player **41** removes MPU **1** from UDK **2**, PC **21** transfers the identification number **33** of the removed MPU **1** from the first 30 rows **36** of table **35** to the group of records **70** that lists "homeless" MPUs **1** (i.e., units not housed in any specific cell **17** and, presumably, located somewhere on the casino floor). As illustrated in FIG. **5**, each "homeless" unit listed in group **70** however is "temporarily owned" by a specific player **41** and visa versa each player **41** becomes linked by PC **21** with a specific MPU **1** having a specific identification number **33**. Note that the last group of records in table **35**, namely group **133**, is essentially a player club database that stores a player's remaining balances **57** and bonus points **68** once the player returns a MPU **1** to UDK **2**.

Once removed from UDK **2**, a player can carry a rented MPU **1** anywhere through a casino and, as long as MPU **1** receives bingo data over RF channel **31**, it will play bingo automatically as illustrated in the flowchart of FIG. **9** illustrating a "verify" task. Specifically in the step "RECEIVE BROADCAST" **60**, MPU **1** receives bingo data, such as called bingo numbers and bingo patterns, broadcast by UDK **2** to all MPUs **1** via antenna **15**. Note that the broadcast data does not have to be encrypted because it is not necessary to encode publicly known data, such as called bingo numbers and bingo patterns being played. In particular, MPU **1** checks for new called bingo numbers in the test step "NEW #?" **61** and for new bingo pattern in the test step "NEW PATTERN?" **62**. Should any new data be discovered, MPU **1** marks electronic bingo cards in its memory in accordance with the received new data in the step "MARK CARDS" **63**. Otherwise, MPU **1** loops back to step **60**. Once MPU **1** marks cards, it sorts the marked bingo cards in accordance with their closeness to winning and displays the best bingo cards on its screen **3** in the step "DISPLAY BEST CARDS" **65**. In particular, if MPU **1** detects a card that achieved bingo, MPU **1** immediately displays the winning card **66** on touchscreen **3** and

continuously blinks card **66** to attract a player's attention. In addition, MPU **1** may play a winning tune through speaker **20**.

The data broadcast by UDK **2** over antenna **15** originates at PC **21**. PC **21** stores a schedule of bingo games or patterns to be played in its memory in a conventional way. PC **21** also utilizes a standard random number generation utility to generate randomly called bingo numbers. As an alternative, a conventional ball hopper or bingo rack may be used to generate random bingo numbers. PC **21** also automatically verifies all sold bingo cards (i.e., bingo cards downloaded in each rented MPUs **1**), with each new called bingo number in order to detect a winning card as taught by U.S. Pat. No. 5,951,396 to Tawil and is further disclosed in applicants' co-pending U.S. Patent Application No. 60/241,982 entitled "Fully Automated Bingo Session." Once a winning card is detected, PC **21** algorithmically computes the identification number **100** of bingo pack **43** that the winning bingo card was downloaded to. Knowing the winning pack number **43**, PC **21** finds the winning player corresponding to the manufacturer's identification number **33** by searching status table **35**. Once the winning player is found, PC **21** updates the player's balance **57** to reflect the winning prize.

Meanwhile, the winning MPU **1** independently detects a winner as described above and starts blinking the winning card **66** on display **3** and optionally plays a winning tune through speaker **20**. At this point, a winning player may approach UDK **2** and claim a prize by inserting the winning MPU **1** back into UDK **2**. A player may insert MPU **1** into any empty cell **17**. PC **21** detects the insertion of MPU **1** through cell **17** polling procedure described above. Upon learning the physical identification number **33** of the inserted MPU **1**, PC **21** searches status table **35** and fetches the identification number **41** of the player who rented the unit and also fetches the player's account balance **57** from table **35**. The account balance **57** includes the player's winnings as described above. Now PC **21** causes BD **13** and CD **14** to dispense the player's balance due. Specifically, BD **13** dispenses the dollar amount of the player's balance **57** and CD **14** dispenses the remaining amount, if any, of cents in coins. Once dispensing of the balance **57** is complete, PC **21** clears balance **57** in player's **41** record in table **35** and also clears MPU **1** manufacturer's identification field **33**. The operation of clearing field **33** releases player **41** from any responsibility for the returned MPU **1**. As a courtesy to the player, PC **21** also causes PRT **10** to issue a return receipt **67** illustrated in FIG. **10**, wherein **68** is the refund value, if any, and **69** is the barcode that uniquely identifies and verifies return receipt **67**.

Optionally, a player may also be required to insert the barcoded receipt **44** into BV **12** and/or insert the player card **39** into magnetic card reader **11**. If such an option is selected, then BV **12** reads barcoded identification **59** of receipt **44** and/or magnetic card reader **11** reads-in player identification number **41** from card **39**, and PC **21** compares read-in identifications **59** and/or **42** of receipt **44** and/or card **39** with the values stored in table **35**. Assuming they match with the read-in identification **33** of MPU **1** stored in the player's **41** record in table **35**, the validity of the winning claim is well-established. Some casinos may even elect to rely exclusively on the validation of receipt **44** and/or card **39** for purposes of paying winners without the requirement of returning the winning MPU **1** into UDK **2**. However, the preferred requirement of returning the winning MPU **1** decreases the casino's labor costs since casino employees will not have to retrieve and return MPUs left all over the casino. Also, it insures that MPUs **1** are readily available for new players to rent. Moreover, it prevents a player from taking a MPU **1** home as a "souvenir" or the like. For all such reasons, it makes sense for a casino to require all players to return all rented MPUs **1** to UDK **2** once a player is finished. A casino is in a position to enforce the return of the MPUs **1** because status table **35** contains detailed records of MPUs **1** rented by players. However, instead of enforcing the return of MPU **1**, a casino may encourage a voluntary return by, for example, awarding a player's account bonus points **68** upon the return of the rented MPU **1**. A player may use the bonus points **68** as discounts for buffets, souvenirs, etc. Also, a casino may impose a deposit fee for renting MPU **1** and refund the deposit to the player through dispensers **13** and/or **14**, once a player returns the MPU **1**.

The primary reason the above-described MPU **1** is equipped with RF-channel **31** is to facilitate automatic playing of bingo on the casino floor. However, some players and some casinos prefer manual entry of all necessary bingo data into the MPUs **1** as described, for example, in U.S. Pat. No. 4,378,940 to Gluz et al., and the article "Bingo Playing Enhanced With New Innovations", Bingo Manager, July, 2001. If manual entry is required, the MPU **1** does not have to be equipped with transceiver **19** and antenna **4** resulting in a less expensive MPU **1**. However, even in such a simplified case, the UDK **2** is still very useful since it completely automates the process of selling electronic bingo cards and yields substantial labor costs savings for casinos and bingo halls.

The aforementioned simple example of the system illustrated in FIG. **1** presumes that a player purchases only one specific bingo pack **43**. However, being equipped with touchscreen **9**, UDK **2** can offer a player a choice of types and quantities of packs as illustrated in FIG. **11** showing a window **71** on touchscreen **9**. Window **71** displays an example of a menu of choices available to the player. Specifically, by touching button **72**, a player can select a "REGULAR" pack costing $5.00 and by pressing button **73**, a player can select a "SPECIAL" pack costing $9.00. Touchbuttons "+" **74** and "–" **75** allow a player to increase and decrease respectively the number of packs to purchase. Finally, touchbutton "BUY" **76** allows a player to actually place a purchase order. PC **21** processes the player's purchase order in a conventional manner.

To this point, it was assumed that bingo packs **43** are to be purchased by the player at the UDK **2** when the player rents MPU **1**. This is acceptable in the case of bingo games organized in sessions of one hour or more. However, in the case of so-called continuous bingo wherein players buy bingo cards for each game separately and may, for example, play some games while skipping other games, it is inconvenient for a player to buy bingo cards at UDK **2** separately for each game. It is therefore desirable to allow a player to purchase bingo packs on the casino floor, through MPU **1** that has an inherent capability of two-way radio communication via transceiver **19**. For example, touchscreen **3** of MPU **1** can display the same menu **71** illustrated in FIG. **11** as the touchscreen **9** of UDK **2**. Once a player completes the purchase order by pressing "BUY" button **76**, MPU **1** can send a request to purchase electronic bingo cards to UDK **2** via RF channel **31**. In particular, MPU **1** can send a "bingo request" data block **77** illustrated in FIG. **12**(*a*) wherein, a data field "BINGO" **78** signifies that the present request is to purchase bingo packs, the next field **79** specifies the number of regular packs to purchase and the last field **80** specifies the number of special packs included in the purchase. Upon receiving a purchase request **77** from MPU **1**, PC **21** fetches from status table **35** a record corresponding to the identification number **33** of MPU **1** and checks the current account balance **57** of the player for sufficiency of funds to cover the request **77**. Assuming sufficient funds are available, UDK **2** transmits purchased elec-

tronic bingo cards to MPU **1** via RF channel **31** rather than downloading purchased bingo cards via connectors **7** and **23**. PC **21** also decrements account balance **57** by the amount of the order.

However, there is a serious concern with the direct two-way RF communication between MPU **1** and UDK **2**. Specifically, such a communication over open RF channel **31** can be easily intercepted. The lack of security can be resolved by encrypting such communications with the help of a private encryption key that is generated by UDK **2** and downloaded into MPU **1** via a secure route formed by connectors **7** and **23**. Specifically, in addition to, and/or instead of bingo cards, PC **21** can download MPU **1** with at least one random digital security key to secure the two-way radio communications between MPU **1** and UDK **2**. Such a digital security key is typically known in the industry under a variety of names (e.g., a digital encryption key, DES key, an authentication key, a private key, a digital signature key, a hashing algorithm, etc.) Importantly, MPU **1** is downloaded with a new unique random encryption key each time MPU **1** is rented and, therefore, even if the same player **41** accidentally rents the same MPU **1** having the same identification number **33**, the downloaded encryption key is different every time. Optionally, the downloaded security key may be printed on sale receipt as is illustrated in FIG. **7** wherein the numeral **82** denotes a security or encryption key. Although an explicit printing of security key **82** may potentially result in complications in the case where a player loses receipt **44**, a "spelled-out" key **82** facilitates auditing procedures and increases a player's trust in the fairness of gaming conducted by the casino.

A random encryption key **82** is generated by PC **21** with the help of random number generation software utility in a conventional way. The details of the generation and utilization of key **82** are omitted herein since techniques of data encryption are well known in the industry and are disclosed in numerous publications including, for example, U.S. Pat. Nos. 4,670,857 to Rackman, 5,643,086 to Alcorn et al., 6,071,190 to Weiss et al., and 6,149,522 to Alcorn et al. Instead, it is re-emphasized that PC **21** downloads MPU **1** with a security key **82** over a secure communication channel formed by cable **24** and connectors **7** and **23** and that the security key **82** changes with every downloading. Being downloaded with a security key **82**, MPU **1** can send authenticated data blocks to UDK **2** over the public radio frequency channel **31**. Specifically, each such data block is authenticated with the help of a digital signature based on the security key **82** as illustrated in FIG. **13**. Similarly, each data block MPU **1** receives from UDK **2** over the public RF channel **31** is also authenticated with the help of a digital signature based on the security key **82** as illustrated in FIG. **13**.

Specifically, FIG. **13** (*a*) shows a "service request" data block **83** originating at MPU **1** on the casino floor. The data block **83** starts with manufacturer's identification number **33** of MPU **1** followed by a block sequence number **84** followed by a digital signature **85** and ending with a data field **86**. Typically, block sequence number **84** is incremented with each new block sent by MPU **1**. In the specific case under consideration, data field **86** is a request to purchase bingo cards **77** illustrated in FIG. **12** (*a*). Importantly, authentication field **85** is generated by MPU **1** as a predetermined function of at least one of the fields **33**, **84** or **86** using a security key **82** downloaded by PC **21** into MPU **1** over connectors **7** and **23**. Due to authentication field **85**, the entire data block **83** is secure even though some portions of the data block (e.g., **33**, **84** and **86**) may not be secure. Therefore, an unscrupulous player cannot advance a false claim that he or she did not play a particular game that resulted in a loss or that he or she won a large prize since no other player can realistically send out a properly authenticated data block **83**. Also, given a sufficiently long authentication field **85** (e.g., five hundred and twelve bits), spurious radio frequency noise cannot realistically produce a false request by a player's MPU **1**. Similarly, a "hacker" who does not know the true security key **82** cannot send a false game request in the place of a legitimate player. In summary, the casino is protected from false claims that might otherwise be advanced by cheats and "hackers" and players are more confident that gaming in the casino is fair and secure.

Each response block **87** transmitted by UDK **2** to MPU **1** is also protected by an embedded authentication field **88** as shown in FIG. **13** (*b*) illustrating a "service request" data block. In FIG. **13** (*b*), manufacturer's identification number **33** of an addressed MPU **1** is the destination address of data block **87**, **89** denotes a block sequence number assigned by UDK **2** and **91** denotes a data field (e.g., bingo card contents). Only a specific MPU **1** addressed in the field **33** recognizes and authenticates data block **87** since only this specific device was downloaded by PC **21** with a specific digital key **82** matching data block **87**. A sufficiently long digital signature **88** virtually guarantees that the outcome of the game shown on touchscreen **3** is correct rather than "hacked" by some prankster.

The above-described technique of secure two-way communication between MPU **1** and UDK **2** over public RF channel **31** with the help of an encryption key **82** downloaded by UDK **2** into MPU **1** over a secure wired channel is useful not only for playing bingo games but is also beneficial for playing "classic" casino games, such as poker, slots and keno. For example, a player can play a slot game on MPU **1** by simply touching touchbutton "SPIN" **92** displayed on touchscreen **3**. Once a player touches button **92**, MPU **1** causes the image of reels **93** on display **3** to spin and transmits an encoded request **83** having data field **86** structured as "spin request" data block **94** illustrated in FIG. **12** (*b*). The field **95** of block **94** specifies a number of coins the player wagered and the field "SPIN" **96** specifies a request to generate a random final position for the reels **93** to stop. Since MPU **1** is not a per se secure device, the outcome of the game cannot be determined by MPU **1** itself. Only secure PC **21** of UDK **2** can be trusted to generate random numbers on behalf of MPU **1** and thusly determine the prize, if any, won by MPU **1**. Upon receiving request **94**, UDK **2** randomly generates a new final position for the "reels" **93** and transmits it in an encoded, authenticated form to MPU **1**. The MPU **1** decodes the response received from UDK **2** and gradually slows down the "reels" to a new final position determined by UDK **2**.

The above general outline of events involved in playing slots on MPU **1** is illustrated by flowcharts presented in FIGS. **14** through **16**. Specifically, FIG. **14** illustrates the "initiate spin" task performed by MPU **1** in response to pressing push-button "SPIN" **92**. Note that similarly to PC **21**, MPU **1** also executes a multitasking application program preferably, in Linux® environment. The processing involves a repetitive polling of touchscreen button **92** by the embedded microprocessor of MPU **1** in the step "SPIN?" **116**. The polling continues until a pressing of button **92** is detected. Then, MPU **1** forms request **94** in the step "FORM REQUEST" **117**. Subsequently, MPU **1** encodes request **94** into block **83** and transmits it via transceiver **19** in the step "TRANSMIT REQUEST" **119**. The request **83** sent by MPU **1** is received by UDK **2** and processed by its PC **21** in the step "RECEIVE REQUEST" **120** shown in FIG. **15** that illustrates a "determine outcome" task. Subsequently in the step "DECODE REQUEST" **121**, PC **21** decodes the true request **94** from its

received encapsulated form **83** using the encryption/decryption key **82** stored in table **35**. In the same step "DECODE REQUEST" **121**, PC **21** strips out the manufacturer's identification number **33** of MPU **1** that transmitted request **83**. Using the decoded manufacturer's identification number **33**, PC **21** then performs the step "FETCH UNIT RECORD" **122** by searching group **70** of table **35** for a record matching MPU**1** that transmitted the received request **83**. Subsequently, in the step "DECREMENT UNIT'S BALANCE" **123**, PC **21**, assuming the current balance **57** is sufficient, decrements a player's balance **57** by the amount of coins specified in the field **95** of request **94**.?? Rob to edit At this point, PC **21** determines the random outcome of player's bet **95** by executing the step "GENERATE RANDOM OUTCOME" **124** involving a generation of a pseudo random number with the help of a conventional software utility. If the generated random outcome results in winnings as determined in the test step **125**, PC **21** increments a player's balance **57**, by the amount won as specified in the paytable of the game stored in the memory of PC **21**, in the step "INCREMENT PLAYER'S BALANCE" **126**. Otherwise, PC **21** directly proceeds to the step "FORM RESPONSE" **127**. In the latter step, PC **21** forms data field **91** and the return address **33** of MPU **1** and increments the block sequence number **89**. Subsequently, PC **21** computes digital signature **88** utilizing the encoding/decoding key **82** in the step "ENCODE RESPONSE" **129**. Finally, PC **21** transmits the fully formed response **87** to MPU **1** via transceiver **16**. The response **87** of UDK **2** is received by MPU **1** in the step "RECEIVE RESPONSE" **130** and is decoded in the step "DECODE RESPONSE" **132** with the help of key **82**. Specifically, the random outcome of the game **91** is filtered out and is presented on touchscreen **3** in the step "DISPLAY OUTCOME" **132** shown in FIG. **16** illustrating a "display outcome" task.

MPU **1** allows playing of a poker game in a similar manner. Specifically, a player touches a toggle touchbutton "DEAL/DRAW" **97** on touchscreen **3** requesting a new "deal." In response, MPU **1** forms a player's request block **83** with the data field **86** structured in the form **98** of a "deal request" data block illustrated in FIG. **12** (*c*) wherein **99** is a number of coins the player bets while the request field **100** specifies a request to generate a random hand of cards. The request **98** is authenticated by MPU **1** and relayed to UDK **2** in the form **83**. Once UDK **2** receives "DEAL" request **98**, PC **21** sends a set of randomly generated cards back to MPU **1** in an encoded and authenticated format **87** with data field **91** structured as shown in FIG. **17** (*a*) illustrating a "deal" data block. Specifically, FIG. **17** (*a*) illustrates a case wherein PC **21** generates a random deal hand consisting of the two of diamonds, seven of clubs, four of diamonds, five of diamonds and six of diamonds. The generated hand is encoded as a data block **101** shown in FIG. **17** (*a*) wherein **102** is a response identification field "DEAL" and **103** is a five-byte long data field containing encoded representation of dealt cards. The received random poker hand is displayed to the player by MPU **1** on its touchscreen **3**. The player then makes his selection as to which cards to hold by touching respective cards on the screen **3** and presses the toggle touchbutton "DEAL/DRAW" **97**. Once the player does so, MPU **1** sends a request **83** to UDK **2** with the data field **86** structured as "draw request" data block **104** illustrated in FIG. **12** (*d*) wherein the five consecutive fields **105** through **106** indicate respectively which cards the player decided to hold as indicated by their value being equal to one, and which cards are to be discarded as indicated by their value being equal to zero. The main field "DRAW" **110** indicates that this is a request to draw random cards to substitute for the cards the player decided to discard. In this specific case, the player makes an obvious choice to discard the "seven of clubs" and retain the rest of the dealt cards. In response, UDK **2** sends back an encrypted block **87** containing a data filed structured as block **111** shown in FIG. **17** (*b*) illustrating a "draw" data block. The response identification field "DRAW" **112** in FIG. **17** (*b*) indicates that this is an outcome of a poker game. Specifically, the five consecutive bytes of information following the "DRAW" field contain the drawn cards, the next two byte data field **113** contains the amount won by the player, and the last two byte data field **114** contains the player's new account balance. As illustrated in FIG. **17** (*b*), the drawn card is the "three of diamonds", the prize won as a result of the "straight" is one hundred coins, and the player's new balance is one hundred twenty coins. Note that MPU **1** does not have any responsibility for generating random numbers nor maintaining the current player's balance but rather simply displays the balance computed by UDK **2** on behalf of MPU **1**.

In a manner similar to that described above, MPU **1** may be adapted to play virtually any casino game, including black jack, keno, roulette, sports book and horse racing. In fact, MPU **1** can play several games concurrently. For example, slots and bingo can be played concurrently as taught in U.S. Pat. No. 4,856,787 to Itkis et al. Moreover, the preferred embodiment illustrated in FIG. **1** can be adapted to implement a broad variety of various applications without departing from the main principles of the invention. For example, although FIG. **1** shows only one UDK **2**, a casino may have any number of such UDKs **2** installed throughout the property and integrated in an extended local area network. The networked UDKs **2** can interchange data over a local area network **22** extended beyond a single UDK **2** and can share a common player database **35**. In a casino equipped with a number of such networked UDKs **2**, a player may rent MPU **1** from a first such UDK **2** and return it to a second such UDK **2**.

Moreover, the extended LAN **22** can be equipped with multiple connectors **23** installed throughout the casino, such as near lounge chairs, for convenient player access as illustrated in FIG. **2** by MPU **1** that is positioned outside UDK **2** and is plugged into LAN **22** via a cable **115** leading to connector **23**. Once securely downloaded inside UDK **2** with authentication key **82**, MPU **1** can be carried by a player to any such external outlet of extended LAN **22**. Once plugged into socket **23**, MPU can directly communicate with UDK **2** over LAN **22** instead of RF channel **31**. Therefore, MPU **1** can send to and receive from UDK **2** data blocks **83** and **87** over LAN **22**. Advantages of such a "plug and play" arrangement include the virtual absence of noise, a much higher channel throughput as compared with RF channel **31**, and an additional level of security afforded by wired cables. These advantages may well outweigh the additional cost of running LAN **22** throughout casino. Of course, a "plug and play" MPU **1** still must be initially downloaded with secure encryption key **82** inside UDK **2**, otherwise MPU **1** can be easily subverted in transit between UDK **2** and socket **23** installed on the casino floor.

Although connectors **7** and **23** are described as the primary LAN **22** channel for downloading to MPU **1** by UDK **2**, their communication function can also be carried out by infrared communication ports built into MPU **1** and UDK **2** as is illustrated in FIG. **18**. As shown in FIGS. **18** (*a*) and **18** (*b*) respectively, MPU**1** is equipped with infrared (IrDa) communications port **135**, while LAN **22** is equipped with a matching IrDa port **137**. Note that although infrared ports **135** and **137** are more expensive than connectors **7** and **23**, the former do not require a precise alignment of the communicating devices and, therefore, are frequently utilized in PDAs for the

purposes of communicating with downloading stations. Ports **135** and **137** allow UDK **2** to download MPU **1** through infrared channel **136**. Moreover, a commercial wireless PDA equipped with an infrared port **135** can function as MPU **1**, provided it is downloaded by PC **21** not only with encryption key **82** and/or bingo pack **43** but also with the above-described executable program for playing casino games and such downloading is performed via an infrared communication port. Note that techniques of downloading executable files from a stationary device into a portable device are well known and not explained herein. Therefore, an opportunity for a player to bring to the casino a favorite PDA and use it as a personal slot machine may be very attractive for some casinos because it decreases the cost of owning and maintaining the rental fleet of MPU **1** devices.

Similarly, an off-the-shelf programmable telephone equipped with a graphics display and menu-navigation keys **6** may serve as a MPU **1**. A broad variety of downloadable "third generation" telephones is available on the market. In case of a telephone-based implementation, a player may use his or her own telephone for playing casino games in the above-described manner, provided of course, that the player's telephone is downloaded with a security key **82** as a precondition for playing casino games. Assuming connector **7** is compatible with the downloading and recharging connector of such a telephone, a player may insert a telephone into any available or reserved slot **17** of UDK **2** and wait a few seconds while PC **21** downloads key **82** into the memory of the player's telephone. In addition to key **82**, PC **21** also downloads the above-described casino games into the player's telephone. The downloadable casino games are preferably written in JAVA language since many modern commercial telephones are capable of downloading and executing application programs written in JAVA language.

Infrared port **135** built into MPU **1** also allows for lateral communication between two MPUs **1** as illustrated in FIG. **18** (*a*). Two MPUs **1** can interchange arbitrary data via their respective ports **135**. Such a data interchange is secure provided two units **1** are placed in close proximity to one another and their IrDa ports **135** are aimed at each other. Note that a likelihood of intercepting a line-of-site infrared communication between two closely located MPUs **1** by an outsider is negligible. This opens up an opportunity for utilization of a MPU **1** as a mobile point-of-sale terminal as indicated by numeral **138** in FIG. **18** (*a*). Specifically, one of the MPU **1** units may be allocated to a casino employee. Initially, MPU **1** allocated to a casino employee may be downloaded with a large number of bingo packs **43** as described above. Subsequently, the casino employee may dispense, via aligned infrared ports **135**, a portion of the bingo packs **43** stored in its memory to a MPU **1**, PDA or telephone in possession of a player. The information about such an indirect downloading of player's MPU **1** by a casino employee may be reported by the employee's MPU **1** to UDK **2** via antenna **4**. Since RF communication between the employee's MPU **1** and UDK **2** is inherently secure, the entire process of indirect downloading of the player's MPU **1** is also secure. The data downloaded into player's MPU **1** from the employee's MPU **1** is not limited to bingo cards. A unique data encryption key **82** reserved for the player can be downloaded from the employee's MPU **1** along with monetary credits and casino games as well.

A viable alternative to downloading files via communication ports **7** and **23** and/or ports **135** and **137** is utilization of smart cards for transporting files from PC **21** to MPU **1**. Assuming card reader **11** is equipped with a smart-card reader/writer circuitry, the necessary files can be written onto a smart-card and subsequently read-in by MPU **1** that is also equipped with a smart card reader/writer peripheral. Since many modern PDA devices are equipped with smart-card readers/writers, the opportunity for a player to play casino games on his or her own PDA in a casino becomes even more feasible, assuming of course, the above-described security techniques are followed.

Another alternative for inputting encryption key **82** into MPU **1** includes a player reading key **82** from receipt **44** and manually entering key **82** into MPU **1** via a touch-pad on touchscreen **3**. Although manual entry of key **82** is subject to error, it may be used as a substitute for the downloading of key **82** in an effort to save costs or in the case of a failure of downloading the key **82** via connectors **7** and **23**.

A system to assure efficient and effective player tracking and downloading of game ticket data to a game unit by a roving cashier is illustrated in FIG. **19**. The system includes a game ticket **150**, game unit **152** (such as a wireless game unit disclosed above), equipped with WiFi transceiver **154**, a wireless barcode reader **156** equipped with a radio transceiver **158** (such as WiFi), a game server **160** including a wireless transceiver **162** (such as WiFi), and a player loyalty (tracking) card **164**. As illustrated, the game ticket **150** is exemplified by a "6-on" bingo pack **166** imprinted with six bingo cards **168** and a ticket barcode **170** (expressed numerically as the ticket identification **172**) that uniquely identifies the pack **166**. The game unit (or player unit) **152** is also uniquely identified by a barcode, specifically by a device barcode label **174** affixed thereto (expressed numerically as the device identification **176**). Similarly, the player loyalty card **164** also carries a barcode label **180** (numerically expressed as the card identification **182**) and may optionally carry a magnetic stripe **184** encoding the same card identification **182**.

The barcode reader **156** is utilized by a roving cashier (floor agent) to read at least two of the barcodes **170**, **174** and **180**. The barcodes **170** and/or **174** and/or **180** read by barcode reader **156** are transmitted by reader **156** (via WiFi transceiver **158**) to the central file server **160** (via its WiFi transceiver **162**), which stores the received (over WiFi channel **188**) the barcodes **170** and/or **174** and/or **180** in internal database **190** (outlined by dashed lines) exhibiting a sales table **192** as illustrated in FIG. **20** residing in the database **190**. The sales tables **192** includes player id **194**, ticket id **196** and device id **198** containing the player identification **176**, the ticket identification **172** and the device identification **182**, respectively. In addition, the sales table **192** includes conventional date row **202** and time row **204** and importantly a salesperson identification row salesperson id **200**.

Once the player identification **176** and the game ticket identification **172** are stored in the database **190**, a sales transaction record is made in the database **190** linking a player identified by the player identification **176** with the bingo pack **166** identified by the barcode identification **176**. Such a sales transaction relationship can subsequently be processed using conventional data processing techniques to generate conventional player tracking reports.

Similarly, once the game ticket identification **172** and the game device identification **182** are stored in the database **190** of the central file server **160**, the latter can wirelessly download bingo pack identification **172** directly into the game unit **152** identified by the game device identification **182** (the central file server **160** stores in database **190** an address translation table that links together bar-coded device identification **182** with the Internet Protocol (IP) addresses of the game unit **152**). Once the game unit **152** wirelessly receives the pack identification number **172** via WiFi transceivers **154** and **162** over the channel **188**, the game unit **152** can then fetch or

retrieve bingo card **168** contents either from internal database **206** (outlined by dashed lines in FIG. **19**), or remotely, from the central database **190** utilizing conventional bingo cards downloading techniques. Subsequently, the game unit **152** can display images **208** of bingo cards **168**, pack id **210** and player id **212** on touch screen **214**.

The system shown in FIG. **19** may be implemented in various embodiments without departing from the spirit and scope of the present invention. In particular, the game unit **152** may be implemented as a stationary PC-type computer interconnected with the file server **160** over a conventional Ethernet network. Also, at least the player card identification **182** may be machine-read by a conventional magnetic card reader rather than by a barcode reader **156**.

Although the invention has been described in detail with reference to a preferred embodiment, additional variations and modifications exist within the scope and spirit of the invention as described and defined in the following claims.

We claim:

1. A gaming system, comprising:

a game ticket having a first barcode acting as a game ticket identifier;

a game unit having a second barcode acting as a game unit identifier;

a game server;

a barcode reader configured to read the first barcode and the second barcode and transmit corresponding data to said game server, said barcode reader being separate from the game unit and not communicating the first barcode to the game unit; and

wherein the game server stores both the first barcode and the second barcode and transmits game data corresponding to the game ticket identifier to the game unit.

2. The gaming system of claim **1** further comprising a player card having a third barcode, said barcode reader further configured to read by the third barcode and transmit corresponding data to the game server.

3. The gaming system of claim **1** wherein said game ticket relates to bingo.

4. The gaming system of claim **1** wherein the game unit is configured to display information corresponding to the game data.

5. A method of downloading to a game device gaming data relevant to a gaming ticket comprising the following steps:

machine reading a game ticket identification with a barcode reader separate from said gaming device;

machine reading a game device identification on a game device with said barcode reader;

transmitting both the game ticket identification and the game device identification to a game server;

retrieving from the game server, game data associated with the game ticket identification; and

transmitting the game data, excluding the game ticket identification, to the game device associated with the game ticket identification.

6. The method of claim **5** further comprising downloading game data corresponding to a game of bingo.

7. The method of claim **5** further comprising utilizing a barcode reader for machine reading said game ticket identification and game device identification.

8. The method of claim **5** further comprising machine reading a player card identification.

9. The method of claim **5** further comprising displaying on the game device game data relevant to the game ticket.

10. A gaming system, comprising:

a bingo game ticket having a first barcode acting as a game ticket identifier;

a game unit having a second barcode acting as a game unit identifier;

a game server;

a barcode reader configured to read the first barcode and the second barcode and transmit corresponding data to said game server, said barcode reader being separate from the game unit and not communicating the first barcode to the game unit;

wherein the game server stores both the first barcode and the second barcode and transmits game data corresponding to the bingo game ticket identifier to the game unit, said game data including bingo card patterns for display on the game unit; and

wherein the game server generates a sales table including at least the following: (i) device identification; (ii) ticket identification; (iii) player identification; and (iv) sales person identification.

11. The gaming system of claim **10** further comprising a player card having a third barcode, said barcode reader further configured to read by the third barcode and transmit corresponding data to the game server.

12. A method of downloading to a game device gaming data relevant to a gaming ticket comprising the following steps:

machine reading a bingo game ticket identification with a barcode reader;

machine reading a game device identification from a game device with said barcode reader;

transmitting both the bingo game ticket identification and the game device identification to a game server, said barcode reader being separate from the game device and not communicating the bingo game ticket identification to the game device;

retrieving from the game server, game data associated with the bingo game ticket identification;

transmitting the game data from the game server to the game device associated with the game ticket identification, said game data including bingo card patterns for display on the game device; and

generating a sales table including at least the following: (i) device identification; (ii) ticket identification; (iii) player identification; and (iv) sales person identification.

13. The method of claim **12** further comprising a player card having a third barcode, said barcode reader further configured to read by the third barcode and transmit corresponding data to the game server.

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